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(WITH ILLUSTRATIONS ON PLATE)

VISUAL organs in animals have been developed according to their needs, and vary in complexity from patches of pigmented epithelium, as in the median eye of amphioxus, perhaps the lowest of the vertebrates, to the highly developed paired eyes of the cuttlefish and squids amongst the mollusca. These latter require keen vision, as they rapidly change their colour reflexly according to the colour of the sea bottom as they swim along, and also for the pursuit of their prey.

In the lowest class of fishes, the cyclostomata, the lamprey, and hag fish, the optic nerves are budded out from the sides of the mesencephalon, and do not decussate, but in the elasmobranchs (sharks, rays, &c.) and all the bony fishes, birds, and mammals, the optic nerves decussate in the chiasma. In some carnivorous fishes, such as the porbeagle and fox sharks, and in most carnivorous birds, such as hawks, owls, and vultures, and in many gulls, such as the gannet, the eyes are set forward on the face at such an angle that a considerable degree of binocular vision is possible, and it is obvious that this arrangement must be of considerable assistance to these birds, who have to hunt for and catch their rapidly moving prey; particularly is this so in many owls, especially the common barn owl. These birds, being nocturnal, require a more accurate vision than hawks, who work by day. The wonderful keenness of sight of vultures is well known, how quickly they appear out of the blue empyrean when an animal lies dying; but accuracy of striking is less necessary in their case than in owls, and their eyes are not placed as far forward as in the latter.

Yet in all fishes and birds, whether vegetable feeders or carnivorous, whether their eyes are set laterally with panoramic vision or forwards on the face with binocular vision, the optic nerves decussate completely, every fibre crossing to the opposite optic lobe. It is not until we reach the mammals that traces of semi-decussation of the optic nerves is found. In animals with completely laterally set eyes, such as the hare and rabbit, whose food does not run away from them and whose panoramic vision is useful to them in seeing their food or an enemy on either side at a distance, the optic nerves decussate practically completely; yet it is possible to demonstrate microscopically that a few fibres do pass round from the optic nerve into the optic tract on the same side. These animals have no binocular vision, and it is well known that a hare may run straight forwards towards the gun, as it cannot see straight in front.

The object of binocular vision is well seen by a study of the chameleon.[1] This little animal has curious eyes ensheathed in horny epidermis, and the two eyes work quite independently of each other, moving about in a jerky fashion, almost like searchlights. One may be pointing backwards and the other forwards, but if the animal catches sight of a juicy morsel, such as a mealworm held up a few inches in front of him, presently one eye will catch sight of it and then the other eye is swept round, both eyes being focused accurately upon the worm, the mouth then slowly opening and the tongue suddenly shot out, like a boomerang, to catch its prey and sweep it into its mouth.

In carnivorous animals binocular vision becomes well marked, especially so in the felidæ, cats, lions, and tigers, whose eyes are set practically as far forward as in the primates. These animals hunt particularly by night, and having to catch living prey consequently require keen vision, the eyes therefore being set far forward in the head, and section of the chiasma shows that a very considerable bundle of the nerve-fibres does not decussate, passing round into the optic tract on the same side. These animals, therefore, have developed stereoscopic in addition to binocular vision, the two images from the two eyes being overlaid on the same area of visual cortex on each side. When we examine the primates, monkeys, anthropoids, and man, binocular vision is even more fully developed, and though all monkeys and the anthropoid apes are vegetable feeders and do not have to catch living prey, yet now the value of binocular stereoscopic vision is associated with the development of the hand as a prehensile organ, objects seized being subject to careful inspection by vision. Section of the chiasma shows an even larger non-decussating bundle, though even in man the decussating bundle is much the larger of the two.

Optic Chiasma

Owing to the semi-decussation of the optic nerves at the chiasma and the relationships of these fibres to the sphenoid bone underneath, the pituitary fossa below and behind, and the third ventricle above, localised damage of these fibres can be produced in various ways. A fracture of the base may pass through the middle line of the sphenoid, damaging the central fibres of the optic chiasma, causing a typical bitemporal hemianopia. There was a case of this recently in St. Mary's Hospital, and I have seen at least two other examples. From above, pressure on the dorsum of the chiasma may be produced through distension of the third ventricle in hydrocephalus resulting from meningitis, or in cerebellar tumours. (Fig. II. on Plate.) This may cause bitemporal hemianopia followed by complete blindness and optic atrophy. Septic infection of the sphenoidal sinus may affect the optic nerve between the chiasma and the optic foramen, causing local damage of the optic nerve, with varying effects upon vision. The optic nerve itself at the optic foramen may be damaged by fracture, or by tumour of the sphenoid compressing the nerve, causing ultimate blindness.

Some of the most important defects in the visual fields are produced by diseases affecting the pituitary gland. This gland, lying in the sella turcica, is formed developmentally by an upgrowth in the median line of the nasopharynx, called Rathke's pouch, which meets a down-growth from the tuber cinereum in the floor of the third ventricle, called the infundibulum. This infundibulum, which becomes the posterior lobe of the pituitary gland, is enclosed within Rathke's pouch, which forms the anterior

* A clinical lecture delivered at St. Mary's Hospital on Feb. 4th, 1935.

lobe and the pars intermedia, the infundibular stalk passing through a diaphragm in the dura mater to reach the floor of the third ventricle. Though the anterior lobe is developed in a somewhat similar fashion to the thyroid gland, yet its endocrine function is very different, largely governing growth and the generative functions, while the posterior lobe secretes a pressor substance, which has a profound effect on raising blood pressure, an intestinal and uterine stimulant, and a galactagogue. It also stimulates carbohydrate metabolism, and its absence leads to excessive deposition of fat.

Giantism

Overgrowth of the anterior lobe, with increased secretion, in young people produces giantism, so long as the epiphyseal junctions of the bones are not ossified.

We need not perhaps accept at their face value the traditional height of Gog and Magog, whose 14 ft. effigies stand in the Guildhall, or the Biblical heroes, Goliath of 11 ft. 9 in., or Og, the king of Bashan, whose bedstead measured 16½ ft. in length. Extraordinary growth has been recorded in certain instances, the recorded limit of height for an English giant, John Middleton, born in 1578, being 9 ft. 3 in., and a Russian, Machnow, with a height of about 9 ft. 5 in. was shown at the Hippodrome in 1905. The skeleton of the Irish giant Patrick Cotter, is still to be seen in Trinity College, Dublin, 8 ft. 7 in. in height, and the well-known skeleton of O'Byrne in the museum of the Royal College of Surgeons, 8 ft. 4 in., which John Hunter procured in a very romantic way.

Giants have been divided into two groups, normal and pathological, but it is highly probable that excessive anterior lobe pituitary activity in the form of a chromophile adenoma is the cause of excessive growth above 6 ft. 9 in., and such giants usually are physically weak or lose their strength comparatively early and die young, while a much enlarged sella turcica has been repeatedly demonstrated e.g., Cushing's[2] case of 8 ft. 4 in. Acromegalic features, such as abnormally long arms and legs, and hands and feet large out of proportion are also usually present. In addition to these great heights, the extremities in some of these individuals were more than correspondingly large, John Middleton's hand measuring 17 in., and the foot of the Russian Machnow, 24 in.

FIG. III.—Acromegalic skull. Anterior view (×½).

Acromegaly

When the hyperactivity of the anterior lobe of the pituitary begins to take effect later in life, after the bony epiphyses have become set, then excessive height is no longer possible, but the skeleton and body take on the curious features known as acromegaly. The disease was first described and named by Pierre Marie in 1886, though the characteristic appearance must have been not unfamiliar through the ages, for a thirteenth century stone statue of a woman, an obvious sufferer from the disease, is, or was, to be seen on Reims cathedral.[3] The word means enlargement of the extremities, and the hands and feet take on a curious overgrowth, the hands becoming spade-like; the skull increases in size so that larger and larger sizes in hats become necessary, the lower jaw much enlarged and protruded, with the lower teeth perhaps ¾ in. in front of the upper, the teeth being spaced, and the tongue and lower lip, and the nose and ears enlarged and often somewhat cyanosed. Often the arms are abnormally long, and there is kyphosis of the spine. Sometimes for years there is excessive muscular strength and sexual power associated with slight giantism and acromegaly, but ultimately, in later middle life, muscular weakness and impotence supervene as the gland begins to lose its function.

FIG. IV.—Lateral view of skull shown in Fig. III. The sella is much enlarged and the mandible hypertrophied and underhung. No affection of vision.

The general appearance in a well-marked case of the disease has suggested a reversion to anthropoid characteristics, and a radiogram (Fig. III.) of an anterior view of the skull of a patient shows the massive, almost gorilla-like, appearance of the facial bones. A lateral view of the skull (Fig. IV.) shows a much enlarged sella turcica due no doubt to the presence of a chromophile adenoma of the pituitary; yet the patient's vision has not suffered from any signs of pressure upwards on the optic chiasma. Drowsiness has been a feature in this case, due probably to interference by pressure with the function of the tuber cinerum above, and this patient has often missed his station by sleeping in the train, and even has fallen asleep playing cards. This symptom has improved under treatment with thyroid extract, and his neck has also become smaller; he formerly required a 19½ in. collar, and he takes size 8 in hats.

Pituitary Infantilism

Pituitary infantilism, due to arrest or non-development of function of the anterior lobe, is one of the varieties of dwarfs, who are often perfectly formed, and they are not infrequently seen in circus side-shows, or on a music hall stage dressed in female garments and trained for singing and dancing.

Infantile characters persist in the treble voice, the absence of hairy development, and immature generative organs. Mentally also they are somewhat immature.

Very tiny people are sometimes met with, one of the smallest on record being Jeffery Hudson, only 18 in. high, in the service of the first Duke of Buckingham, who had

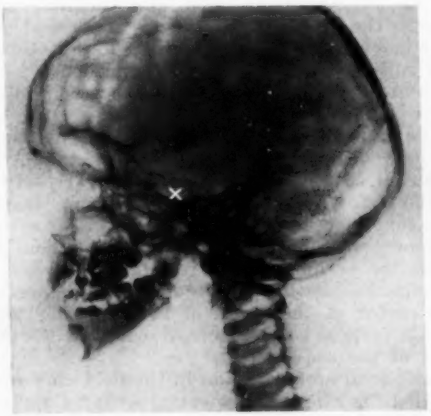

FIG. V.—Lorain infantilism due to cystic adamantinoma. Note "hammered metal" appearance of skull. Enlarged sella with calcareous deposits in tumour. Bitemporal hemianopia. This radiogram has been reduced to about a quarter of its width, but the sella is shown (natural size) in Fig. V.A on the Plate.

him served up in a cold pie at a dinner given to Charles the First, and his Queen. Jeffery Hudson is recorded to have fought two duels, one with a turkey cock and another with a Mr. Crofts, whom he shot dead from horseback.

In another type of tumour of the anterior portion of the gland in infancy, known as adamantinoma, which grows from Rathke's pouch, the gland is degenerated from the first, and may become cystic as well as tumefied. In these cases the normal growth is inhibited, and the patient shows the well-known signs of infantilism, as described by Lorain, and by Fröhlich, obesity in the latter form being superadded to infantilism when the posterior lobe of the gland is also destroyed.

A typical case is a boy of 13, in whom, at operation, a large cystic adamantinoma of the pituitary was found enclosing a greenish fluid full of cholesterin. He stopped growing and began to put on fat two years ago, and lately at school, owing to complaints of his sight, his eyes were examined and papilloedema was found, for which reason he was sent to St. Mary's Hospital. Here we found typical bitemporal hemianopia, or blinker fields, and X ray (Fig. V.) (and V.A on Plate) of the skull showed an enlarged sella and evidence of a sellar tumour spreading upward, with calcareous deposits.

In this and other tumours of the anterior lobe of the pituitary there is a likelihood of pressure upwards and forwards against the optic chiasma, the lower decussating fibres therefore suffering first, with corresponding defects in vision, affecting primarily the upper quadrants. Scotomata will be bitemporal, though usually much more marked in one eye than the other, the initial visual defect being usually a peripheral scotoma in the upper temporal field of one eye only. As the disease advances and the pressure becomes greater on the optic fibres, the temporal scotoma increases, becoming quadrantic, and later involving the whole half field, while the temporal field in the opposite eye begins also to show defects, till at last complete bitemporal hemianopia, or blinker fields, becomes established. The hemianopic pupil, Wernicke's sign, has been described as present in such cases by several writers, but I was unable to demonstrate it in the boy described above, although his temporal fields were completely blind even to a brilliant light up to the midline and fixation point; his pupil reacted equally smartly from either direction. It is a very difficult sign to test for, as it is necessary to use a fine pencil of parallel rays of light so as to avoid illuminating the sclerotic or the side of the nose. I am not convinced that I have ever seen a hemianopic pupil reaction in a human patient, though I have seen it in a cat after dividing one optic tract. In contrast with Lorain infantilism are cases of achondroplasia, a form of dwarfism due to developmental defect in certain cartilage bones, especially the long bones. Such cases provide most of the Court dwarfs and jesters of history. Their wit and intelligence are normal and they are often strong and agile, and good gymnasts.

A man of 53, of just the same height as the boy, 52 in., has a large head, somewhat resembling the hydrocephalic or even acromegalic type, taking a $7\frac{3}{4}$ size hat. His limbs are very short, especially the legs, but the trunk is almost normal in development. There is no pituitary or other known glandular defect here, and no affection of vision.

In the early stage of pressure by a pituitary tumour, there is sometimes a paracentral scotoma developed, due to the macular fibres which decussate at the back of the under surface of the chiasma being pressed on. All varieties of visual field defect can be produced by pressure from these tumours. Sometimes the growth escapes through the diaphragma sellæ, and presses upon and may destroy completely one optic tract, causing homonymous hemianopia, or it may press forwards in front of the chiasma and produce partial or complete blindness of one eye only.

A patient who shows such a defect, affecting one eye only, (see Fig. VI.) is aged 65, and only four months ago noticed a defect in his right outer field. This does not seem to have got any worse, according to his own account, but on charting his visual fields I found a defect of the whole of the temporal field of the right eye, both upper and lower quadrants, the nasal field of the right eye and the whole field of the left eye being unaffected. Careful examination showed that there is a broad band of complete blindness in the upper part of the right lower quadrant running inwards to the fixation-point, whereas the upper quadrant and the rest of the lower quadrant can perceive an object, though the illumination is less bright than in the nasal field, and there is complete loss to colour in both quadrants of the temporal field. This is a very unusual distribution of field defect, to find such an extensive loss in the one eye only, with no trace of loss in the opposite eye. It might suggest a lesion of the optic nerve only in front of the chiasma, but X ray photographs (Fig. VII. on Plate) of his skull show great enlargement of the sellar turcica, with erosion of the posterior clinoids, demonstrating the presence of an intrasellar tumour. Nevertheless this patient is in perfect health, so far as he knows; there is no loss of strength, there is no headache, vertigo, nor any general signs of giantism or acromegaly. Yet the X rays show unmistakably the large skull and acromegalic appearance

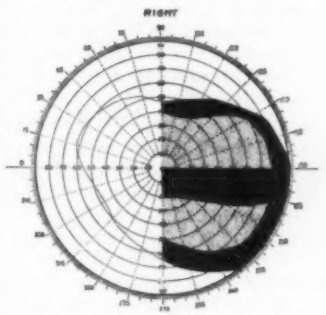

FIG. VI.—Latent acromegaly. Incomplete temporal hemianopia of right eye only. (The radiographic condition is shown in Fig. VII. on Plate.)

of the lower jaw, which is particularly massive, and provide clear evidence of a chromophile excessive activity in the anterior lobe. The pituitary tumour in this case is probably a mixed type of adenoma, in which the majority of cells are of the neutrophile type, with only slight excess of the internal secretion of the anterior lobe.

The chromophile and chromophobe types are the two common forms of pituitary adenomata, chromophobe being the more frequent of the two, though owing to the absence of giantism or acromegaly with these tumours, they are less notorious and perhaps less interesting in their general effects. The rarer basophile adenomata do not affect vision.

With regard to the treatment of these sellar tumours, administration of thyroid extract has been used, and some improvement has been observed both as regards the general symptoms and the visual fields, though usually only for a time; but the only certain improvement, or chance of cure, is by operation and the excision of the cyst and of its walls, or of the tumour, if not cystic. Cushing was one of the first to attack these tumours surgically, and he used the intranasal route, decompressing the sella turcica through the sphenoidal sinus. This route has, however, been entirely superseded by the transfrontal method, which is now one of the most satisfactory operations in cerebral surgery. The boy with Lorain infantilism was operated on by Mr. A. Dickson Wright and is making a good recovery, and his papillœdema is already improving, though there is no recovery yet in the temporal fields, and in my experience such recovery is unlikely. In his case papillœdema was commencing as a result of the general increase of intracranial pressure, but in the adult patient of to-day there seems to be no evidence of increase of intracranial pressure. His visual defect is possibly stationary, according to his own account, and he complains of no general symptoms of headache or discomfort, and, as he says himself, his age is 65, all these points being arguments against operative treatment. Should, however, his visual defect be found to increase in intensity, or headache or other symptoms of intracranial pressure develop, the present decision to postpone operation may have to be altered.

Cortical Visual Centres

The visual fibres pass from the optic tracts into nerve-cells in the external geniculate body, thence by a relay by the optic radiations spreading to the visual cortex in the occipital lobe, known as the area striata. Here the fibres end in the grey matter of the cortex almost entirely on the inner aspect of the occipital pole around the calcarine fissure, the area striata reaching forwards almost as far as the junction of the calcarine with the parieto-occipital fissure, and backwards as far as the occipital pole and slightly on the outer side of the lobe. The representation of the areas of the retinæ keep their position in optic nerve, chiasma, tract, radiations, and occipital cortex, so that fibres from the upper halves of the retinæ pass in the dorsum of the chiasma, thence in the dorsal portion of the optic radiations to the lower half of the cuneus and the upper lip of the calcarine fissure. The fibres from the lower halves of the retinæ pass along the under surface of the chiasma, along the ventral portion of the tract and geniculate body to the optic radiations, but here they make a curious bend outwards and forwards into the uncinate region of the temporal lobe, there spreading out over the tip of the descending horn of the lateral ventricle, before turning back along the inferior aspect of the ventricle to reach the inferior lip of the calcarine fissure and the lingual lobe. According to Holmes and Lister [4] and most writers on the subject, the calcarine fissure is the boundary line between the upper and lower quadrants. It is obvious, therefore, that the upper lip of the calcarine fissure and the lower portion of the cuneus is the cortical representation of the lower quadrants of the visual fields, which is by far the more important part of our vision. This area of the cuneus, calcarine fissure, lingual lobe, and occipital pole is known as the area striata, or the visuo-sensory area, and is marked out by the whitish line of Gennari, which corresponds to the optic radiations.

Numerous instances of injury to the occipital lobe, such as gunshot wounds during the war, go to prove that the macula is represented at the tip of the occipital pole, lesions limited to this area causing a paracentral scotoma only, the peripheral portion of the field being unaffected. Furthermore, it would appear that concentric layers forwards of the calcarine area represent concentric areas of the visual fields towards the periphery. There is also evidence that the horizontal levels of the fields are represented in the cortex of the depth of the calcarine fissure, while the vertical bands are represented on the mesial surface of the area striata.[4]

A peripheral area of vision in the field may remain when there is a large paracentral scotoma spreading from the fixation-point out near to the periphery. This would indicate a damage to the occipital pole of the posterior portion of the cuneus and lingual lobe, with some escape of the anterior portion of the visual centre. The curve outwards of the lower portion of the optic radiations into the temporal lobe is the cause of partial hemianopia being sometimes found in association with temporal tumours, careful perimetric fields showing scotomata in the upper quadrants, especially in the nasal field of the eye on the side of the lesion.[5] Owing to the sweep of the dorsal portion of the optic radiations close beneath the parietal cortex, a lesion here is apt to catch these optic radiations and may produce either complete hemianopia or a quadrantic lesion of the lower fields.

Complete destruction of the half vision centre in the occipital area causes total hemianopia, the blind area reaching to the fixation-point, and it seems certain that the macula is not specially bilaterally represented. Partial lesions may cause only partial loss of vision of a hemianopic type, and the grosser forms of vision, such as perception of light and movement, may persist scarcely altered, but the recognition for shape and form may be very deficient, and colour completely lost in the damaged fields. In slighter cases still, shape and form and general illumination may be scarcely affected, though the recognition of colour may be abolished in the blind halves, a hemiachromatopsia. It seems as though the functions of the visual cortex may be divided into light, movement, form, and colour, in progressive order of elaboration, a slight lesion abolishing mainly colour perception, whereas perception of light and movement may persist even with considerable damage. Since colour tests stimulate by only one narrow band of wave length, it is not difficult to understand that a slight lesion of the centre will abolish colour perception, while the coarser stimuli of ordinary light, form, and movement, involving the whole octave of the spectrum, will still evoke responses, though they also are diminished in intensity. For this reason the colour test is much more delicate and easily applied than tests of the field dependent on the recognition of very small white objects, though it is, of course, necessary to be sure that the patient is not congenitally red or green blind. When colour sense is lost, there is probably always some diminution of

form sense if a sufficiently small test object is used, such as one measuring 0·3 mm. I find colour testing very useful and rapid in neurological perimetric work, using Gowers' method [6] instead of a perimeter. The test objects I use are two beads, bright red and green, fixed on the ends of a black steel rod about 12 in. in length.

Flicker is an intermittent stimulus, and may be compared to movement of a test object as a stronger stimulus than a stationary object. Anyone who has driven along a road when a low sun is shining through palings across the road will appreciate the intensity of flicker as a stimulus. At high speeds flicker becomes fused to a constant stimulus of steady light. Thus an alternating current supply for electric lighting must have a periodicity of not less than 40 cycles per second, or flicker will become noticeable. The rate of fusion for flicker becomes lowered in lesions of the optic fibres, and tests to determine this rate may be used for comparison of the visual acuity of the quadrantic fields in pituitary lesions, or in other causes of partial hemianopia.

The onset of hemianopia, due to thrombosis of the calcarine artery, may be accompanied by xanthopsia. One of my patients with hyperpiesis developed right hemianopia when in Lincoln cathedral, seeing everything bathed in a golden light for some minutes before her vision failed. Holmes also quotes a case of a woman with occipital lesion, who saw golden crosses and figures.

Word Blindness, Visual Orientation, and Stereoscopic Perception

The angular and supramarginal gyri have definite functions concerned with visual perception and understanding. On the left side of the brain in right-handed people there is an area called the angular gyrus, whose function is perception and memory retention of written speech, and lesions in this centre may cause inability to read and write. Lesions in the neighbourhood of this centre on the left side may also produce *visual agnosia*, a condition in which objects seen are not recognised until they are handled. The optic radiations run very close beneath this centre, and it is owing to this fact that David Ferrier made the mistake sixty years ago of asserting that this was the cortical centre for vision, as he found that destructive lesions of this centre produced blindness of the opposite eye in animals. It was not until Sharpey Schafer demonstrated that injuries carefully limited to the grey matter in this area did not appreciably affect vision, that it was realised that the blindness produced by Ferrier was due to injury of the closely underlying optic radiations.

Another interesting fact associated with lesions of the optic radiations at this level on the left-hand side is that it produces word-blindness. A localised lesion at this level beneath the cortex, without damaging the actual angular gyrus cortex itself, will produce complete inability to read, though the patient can write freely. Hence we have the curious phenomenon that the patient may write freely and at large, but cannot read a word as soon as he has written it. Such patients always have right hemianopia in addition. This condition, due to a localised vascular lesion, thrombotic or hæmorrhagic, and usually in older persons, is not to be confounded with congenital word-blindness, in which the visual word centre in the angular gyrus does not appear to develop its normal function. Certain school-children have been found who never learned to read, though they may show normal intelligence in other respects.

Bilateral lesions of the supramarginal gyri have been shown to produce apraxia of the limbs, or an inability to perform simple movements, and a disturbance of vision in which the relative sizes and distance of objects is not appreciated, in which the visual attention is poor and orientation faulty, so that a patient thus afflicted has the utmost difficulty in finding his way across a room past simple obstacles such as chairs, even though he sees them quite well. Two cases have been described in which there was complete loss of stereoscopic perception of depth, everything appearing flat and bidimensional.

One case described by Riddoch [7] of a gunshot wound through the left frontal area, the bullet finally coming to rest close to the right calcarine fissure, gave rise to a left hemianopia with incomplete recovery of the lower fields. In addition to considerable sensory loss on his right hand, the patient had complete loss of *stereoscopic* perception of depth, all objects appearing flat and bidimensional, so that he had great difficulty in recognising faces, and he also had loss of visual orientation with complete inability to judge distances.

Riddoch does not explain the condition, but it was clearly not due to any loss of function of the right occipital cortex, as the stereoscopic defect applied to all the undamaged fields. The stereoscopic loss was possibly due to a bilateral lesion of the longitudinal fibres connecting the occipital and frontal lobes, and to an intellectual loss of power of fitting the two half fields together, comparable to apraxia of the hands. Holmes [8] published a similar case amongst his eight cases of loss of visual orientation in supramarginal gyrus lesions.

Visuo-psychic Centre

Irritative lesions of the calcarine area, such as may occur in migraine, or in adhesions of old meningitis, which may set up epileptic seizures, may be preceded by low-grade visual spectra, such as flashing red and green lights, or the fortification spectrum of migraine. It is practically certain, therefore, that irritative lesions of the occipital half-vision centre do not produce the elaborate images of intellectual vision, but that these must be formed elsewhere by redistribution of stimuli from the occipital cortex.[10] Such a visuo-psychic centre may be in the upper portion of the cuneus, the fusiform gyrus,[5] and on the outer side of the occipital cortex, but there is very little definite knowledge, except that electric stimuli to this area will produce movements of the eyes. Without doubt, visuo-psychic perceptions are ultimately concerned with the frontal lobes.

Visual Hallucinations

Visual hallucinations are well-known phenomena in delirium tremens and in other insanities, but are especially liable to occur when there is a lesion of the visual apparatus. This may be anywhere between the eye itself and the area striata in the occipital cortex, and the hallucinations are liable to be referred to the blind fields only when the lesion affects the optic tract, geniculate body, optic radiations, or calcarine cortex. My own view [9] is that high-grade hallucinations cannot possibly be elaborated in the half-vision centre in the calcarine area. This centre, as a sensory centre, no doubt corresponds to Hughlings Jackson's "middle level" of the motor representation of the limbs and trunk, the so-called "motor" area. Low-grade visual sensations, such as red and green lights, or the fortification spectrum of migraine, are probably originated by a discharging lesion in the area striata, such as areas of softening, but complex visual phenomena are probably no more originated there than are complex purposive movements originated

in the "motor" limb centres. The visuo-psychic area must have a large share in their production, though such action may be set up reflexly by peripheral irritation of the optic path. For this purpose we may consider the area striata to be part of the periphery, which includes the eye and retina and the whole course of the optic fibres. The peripheral disease merely determines the localisation of the spectral hallucinations which in disease of one eye are referred only to the visual field of that eye, whereas in disease of one optic tract, or of the radiations or the area striata, they are referred to the corresponding half fields.

Numerous cases have been described of visual hallucinations seen in the blind fields in patients suffering from hemianopia, due to various lesions from optic tract to occipital cortex. The visions may be of people or animals, usually in the periphery of vision, standing or moving. In a case of my own [10] following a fit with left-sided convulsions, the patient described very elaborate visions of people in wheel chairs dressed in brilliant garments of green and gold, passing from the left periphery to the midline. In occipital tumours similarly, hallucinations have been described, but more particularly these have been observed in cases of temporal tumour.

In the case of right temporal tumour of Cushing's,[11] with left upper quadrantic field defect, referred to by Horrax,[12] a young man, subject to uncinate attacks, had a recurring visual hallucination on his left side in which he saw his father sitting at a table playing cards, and quarrelling with some other men, the patient always exhibiting signs of fear and horror. Subconscious memory was apparently not responsible for this aura, as he had never seen his parent in such a position, nor did his father ever play cards.

The probability is that here also the visual hallucinations are produced reflexly through irritation of the optic radiations acting through the connexions of the occipital cortex with the visuo-psychic and frontal centres.

Transient Hemianopia and Macular Centre

Temporary exhaustion paralysis of the half-vision centre on one side may occur, and does occur commonly in migraine possibly due to vaso-motor spasm of the calcarine branches of the posterior cerebral arteries causing temporary anæmia of this area. Temporary hemianopia is a common symptom in many cases of migraine, and it may be associated with the low-grade visual aura known as the scotoma scintillans, or fortification spectrum. Very occasionally this hemianopia has been known to remain permanent, possibly due to non-dilatation and thrombosis of the calcarine vessel following the primary spasm in the artery.

A similar exhaustion paralysis of the half-vision centre may be produced by an irritative discharging focus, as a cyst or area of softening, in the neighbourhood, as in the precuneus or quadrate lobe, when epileptic fits may be succeeded by complete hemianopia lasting perhaps 24 hours. In such cases, if examined fairly early, it will be found that the hemianopia is absolute, a bright flame not being seen until it reaches the fixation-point. All these cases of hemianopia when they clear up, clear up from the centre towards the periphery. A point over which there has been much controversy in the past is the representation of the macula in the cortex, and it has been suggested that the whole of it is bilaterally represented. I proved many years ago, in 1897,[6] that exhaustion hemianopias are absolute up to the middle line and fixation-point, and the numerous cases of war wounds damaging the occipital cortex have gone further to prove that there is no special bilateral representation of the macula. Yet numerous cases show hemianopia fairly complete up the middle line, except for the exclusion of a small area leaving the fixation-point in the seeing field. This is probably due to the fact that the macula is represented at the occipital pole and slightly on the outer side on the occipital cortex close to the junction of the arterial supply where the middle cerebral and posterior cerebral vessels meet, and the escape of the macular area is probably due to an alternate supply thus reaching it from the terminations of the middle cerebral vessels.

A man, aged 70, was attacked by severe headache and gross disturbance of vision. When admitted to hospital he was found to have complete left hemianopia and no other abnormal symptoms. The blindness of the left half fields was still absolute three weeks after the onset. The lesion was probably a thrombosis of the calcarine branch of the posterior cerebral artery, and it is quite probable that if he were to be tested carefully six or twelve months later, it would be found that a small area around the fixation-point would then be included in the seeing half field, due to partial recovery of the macular centre at the occipital pole, owing to the alternative blood-supply.

Double Hemianopia

A bilateral lesion, therefore, of the occipital cortex, if it is not destructive, such as by gunshot wound, but due to cerebral thrombosis, will show at first complete blindness, a double hemianopia, with subsequent recovery of a small area of central vision of about 5° around the fixation-point, resembling in appearance the well-known pin-point fields of hysteria. The vision differs from that of the hysteric in that in the organic case there is very marked loss of power of orientation, as the loss of peripheral vision is real and not psychical; in them there is no visual reflex from the periphery, and consequently the patient is much disturbed with regard to his own position and the position of objects in space. His vision may in fact be compared to that of a normal individual looking through two parallel tubes held close up against each eye.

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UNIVERSITY COLLEGE HOSPITAL.—The Duke of Kent, president of the hospital, was in the chair at the centenary banquet held at the Guildhall on May 2nd in support of the appeal for £250,000 to provide a new pay-bed hospital and nurses' home, and for extensions to the antenatal and infant welfare departments. In replying to the toast of the hospital, proposed by the Duke, Sir Herbert Samuelson, chairman and treasurer, said that of late years they had concentrated on antenatal and child welfare work, and they could boast that they never lost sight of a child born within their portals until he had attained the age of twelve. Donations amounting to £22,882 have been received, including £1000 from the Duke's wedding fund and £7500 from Sir H. Samuelson.

ÆTIOLOGY OF ACUTE RHEUMATISM

EXPERIMENTAL EVIDENCE OF A VIRUS AS THE CAUSAL AGENT

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WITH A NOTE ON PHOTOMICROGRAPHS ON SPECIAL PLATE by J. E. BARNARD, F.R.S.

THE view that rheumatic fever is of microbic origin was first formulated in the later part of the nineteenth century. Following Mantle's description in 1887 of a diplococcus that he had isolated from the blood of patients with acute rheumatism many reports concerning the bacteriology of the disease were published. The belief that streptococci are ætiologically related to the disease was mainly founded on the work of Triboulet and Apert in 1898, and on that of Westphal, Wassermann, and Malkoff in 1899. In this country the researches of Poynton and Paine in 1900 were the first to awaken interest in the bacteriology of the rheumatic disease. Their conclusions gave rise to a lengthy and world-wide controversy which has continued to the present day. Although it is now universally recognised that hæmolytic streptococci play an important part in the ætiology, the evidence that has accumulated during the past 35 years still fails to provide conclusive evidence that these organisms represent the causal agent. It is unnecessary to review here the extensive literature on which this statement is based. Detailed critical reviews by Wright (1929) and Gibson and Thomson (1933), which include a consideration of the allergic theories advanced by some modern writers, are readily available, and to these the reader is referred. It therefore appears to be fair to state that the cause of rheumatic disease is still not definitely known.

The demonstration of a virus as the causal agent of acute rheumatism has been attempted by several investigators.

De Vecchi (1912) reported the production of a myocarditis which he regarded as similar to that of rheumatic fever by the inoculation into rabbits, dogs, rats, and mice of bacteria-free blood obtained from patients suffering from rheumatic fever. These observations were partially confirmed by Natali (1923). Attempts by Miller (1924) to repeat the experiments recorded by these workers were unsuccessful. Rabbits and guinea-pigs were inoculated with whole blood, serum, joint fluid, pleural exudate, throat washings, and suspensions of tonsillar tissue. The inocula were in every case bacteriologically sterile. Out of a total of 107 animals inoculated 2 developed an acute non-bacterial arthritis. In about half the rabbits and two-thirds of the guinea-pigs myocardial lesions were encountered which consisted of interstitial accumulations of lymphocytes and endothelial cells. Similar lesions, however, were observed in control animals, and it was therefore concluded that the experiments described by the Italian workers were inconclusive. Gross, Loewe, and Eliasoph (1929) have reported an extensive series of somewhat similar experiments in which seven different species of animals were tested. The results were entirely negative.

These unsuccessful experiments do not necessarily imply that a virus is not the cause of rheumatism; they merely show that the animals tested are not susceptible to inoculation. As is well known, quite a number of virus diseases have not yet been successfully transmitted to species other than that of the natural host, though some remarkable advances have been made in this direction in recent years.

In THE LANCET last week (Schlesinger, Signy, and Payne, 1935) it was suggested that the infection with hæmolytic streptococci, by producing a condition of increased tissue susceptibility, enabled some as yet undiscovered causal agent to enter the body, or allowed such an agent already lying latent in the body to assume active characters. It was further suggested that this causal agent might be of the nature of a virus. In the present paper the results of an attempt to obtain experimental evidence in favour of this hypothesis are recorded.

One of us, B. S., was responsible for the clinical part, and A. G. S. for the clinical pathology of the investigation now to be described. The examination of rheumatic exudates and the agglutination tests with the antigens obtained from these were performed at the Lister Institute by C. R. A., who is alone responsible for this part of the work.

Methods Employed

It has already been mentioned that the results of inoculating animals with rheumatic joint fluids, &c., have been unsatisfactory. It seemed desirable therefore to employ a technique whereby a preliminary concentration of the causal agent could be obtained. One possible method of doing this was to submit rheumatic exudates or suspensions of infected tissues to high-speed centrifugation in the hope that the agent would be deposited in the sediment so obtained. The high-speed centrifuge has been used successfully for this purpose in the study of several virus diseases, including vaccinia (Eagles and Ledingham, 1932), psittacosis (Bedson, 1933), trachoma (Thygeson, 1934), varicella and zoster (Amies, 1933, 1934). Only those virus agents of which the infective particles are relatively large (100–200 mμ) are susceptible to the degree of centrifugal force developed by the high-speed machines at present available. It was realised therefore that this method would only be successful if the rheumatic agent were of this order of size.

Search for Elementary Bodies in Rheumatic Exudates

It seemed reasonable to assume that the most active and extensive inflammatory lesions would contain the causal agent in greatest amount. For this reason, the majority of the cases chosen for study were examples of very acute infections that had rapidly progressed to a fatal termination. In 4 of the 7 cases examined, the duration of the pericarditis had been under five weeks. At the post-mortem examination each of these revealed a pericarditis with the typical "bread and butter" appearance. In one case death had occurred rapidly from acute carditis and, although a pericardial effusion was found, there was no evidence that the pericardium itself was involved. Histological examination showed widespread collections of Aschoff nodes throughout the myocardium and cardiac valves, and also in other areas of the body. In the three remaining cases the pericarditis was of a more chronic

* Working with a grant from the Harmsworth Fund.

character, and firmer adhesions or almost total obliteration of the pericardium were encountered at autopsy. Pneumonia of the type that many authorities now recognise as specific in rheumatism was present in 6 of these 7 cases.

The pericardial fluid was removed with aseptic technique within twelve hours of death.

After carefully sterilising the skin over the precordium a needle was inserted in the second left intercostal space close to the sternum, with the cadaver in a propped-up position. The fluid was then withdrawn with a syringe and transferred to a tube containing a few cubic centimetres of a 3·8 per cent. solution of sodium citrate. In three cases in which there were extensive pericardial adhesions this method proved unsuccessful, and the fluid was then obtained after the thorax had been opened, the surface of the pericardium being sterilised with a searing iron before insertion of the needle.

Samples of pleural fluid, if present, were obtained in the same manner. Each specimen was tested for sterility by cultivation in 10 per cent. serum broth for 72 hours. The pericardial fluids proved to be sterile in every case.

The pericardial fluid thus obtained was then submitted to a process of fractional centrifugation similar to that employed for obtaining elementary body suspensions from varicella and zoster vesicle fluids (Amies, 1934). The exudate was first centrifuged for 20 minutes at 2000 revolutions per minute to remove cell debris. The clear supernatant fluid was transferred to fresh tubes and again centrifuged at a speed of 12,000–14,000 r.p.m. for 30 minutes. This yielded a small deposit, just visible to the naked eye. The supernatant fluid was removed and discarded, and the sediment was rubbed off the bottom of the tube with a glass rod, resuspended in physiological saline and again deposited by means of the high-speed centrifuge. Finally, the washed deposit was suspended in physiological saline containing 0·25 per cent. of formalin and centrifuged lightly to remove any imperfectly dispersed material. The suspension thus prepared had a bluish opalescent appearance and showed no tendency to spontaneous flocculation.

MICROSCOPIC EXAMINATION OF SUSPENSIONS

When a drop of the suspension was examined under the microscope, using the dark-ground method of illumination and a magnification of 1000 diameters, it was found to contain numberless small particles. This, of course, was to be expected. Slight differences in the size and refractility of these particles was observed, and it was recognised that many of them were probably minute fragments of cell protoplasm such as occur in any pathological fluid. In addition to these, however, there were other particles of uniform size which, in the light of previous experiences with other virus diseases, appeared closely to resemble elementary bodies. Several methods of preparing stained films of these suspensions were tried. Loeffler's method of staining flagella and the modified techniques of Zettnow and Cassares-Gil gave satisfactory results. In such preparations it was again possible to identify particles of uniform size. In the case of one of the pericardial fluids examined it was possible by repeated fractional centrifugation to obtain an almost pure suspension of these bodies whose appearance, both under dark-ground illumination and in stained preparations, was quite definite.

Pleural exudates were present in 5 of these 7 cases. Four of these were submitted to high-speed centrifugation, and numerous bodies similar to those found in the pericardial fluids were recognised in one of the deposits so obtained. Details of the seven cases examined with the results obtained in each are given in Table I.

In order to provide adequate controls for this investigation 8 pericardial exudates and 2 pleural exudates obtained from non-rheumatic conditions were centrifuged at high speed in exactly the same manner as that described above. These control fluids yielded small deposits from which fairly stable suspensions could be prepared. These also showed large numbers of particles of varying size and refractility, but the bodies of uniform size and characteristic appearance seen in the rheumatic pericarditis suspensions were absent.

PHOTOMICROGRAPHY

Note by J. E. BARNARD

The photomicrographs accompanying this paper are of material supplied by the authors.

FIG. I.—Agglutinated suspension in hanging drop under ordinary dark-ground illumination. Objective used 16 mm. apochromat. (× 70.) Transmitted light.

FIG. II.—Agglutinated suspension mounted on quartz slide and somewhat compressed between slide and cover-glass to show the probable virus bodies immersed in a granular matrix. The photomicrograph was taken in ultra-violet light by the dark-ground method devised at the National Institute for Medical Research. It will be seen that the probable virus bodies have a different refractive index in the wave-length used to that of the matrix; the latter is substantially less visible. This difference is detectable in visible light if a high aperture dark-ground illumination method is used, but it would be difficult and perhaps impossible to obtain satisfactory photomicrographs under those conditions. Objective used 1·7 mm. quartz monochromat. with an effective N.A. of 2·5 in the wave-length used. (× 1000.)

FIG. III.—Unagglutinated suspension of centrifuged deposit. The method adopted was substantially the same as that described in the identification of virus bodies in infectious ectromelia (Barnard, 1932). As only one sample was available for photography no claim is made that anything like a conclusive result has been obtained, but it is suggestive. The deposit apparently consists of virus bodies with a considerable proportion of tissue debris. The suggestion that some at least are virus is dependent on regularity of size and constancy of refractive index in all wave-lengths that have been used. Further, single bodies are seen which are elongated and suggest that transverse binary fission is taking place. The size of the virus can hardly exceed 100 mμ and may be as small as 80 mμ, but the latter dimension is difficult to determine with any accuracy unless photomicrographs are taken in a shorter wave-length than that used. (× 3200.)

FIG. IV.—Streptococcus photographed under similar conditions as Fig. III. and at exactly the same magnification for purposes of comparison.

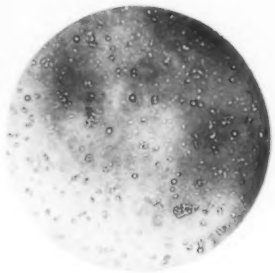


FIG. I.

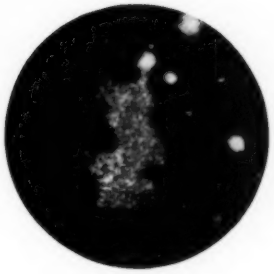


FIG. II.

DRS. SCHLESINGER, SIGNY, AND AMIES:

ÆTIOLOGY OF ACUTE RHEUMATISM

PHOTOMICROGRAPHS BY
MR. BARNARD

(Described on opposite page)

FIG. III.

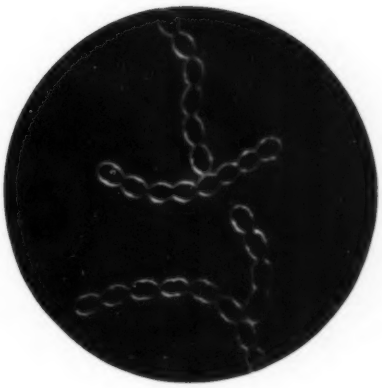


FIG. IV.

DR. HARRIS: VISION IN RELATION TO CEREBRAL LESIONS

FIG. I.—Radiogram of normal sella turcica. In this and subsequent Figures a cross indicates the bottom of the sellar depression.

FIG. II.—Erosion of sella by distension of third ventricle in hydrocephalus due to tumour in posterior fossa.

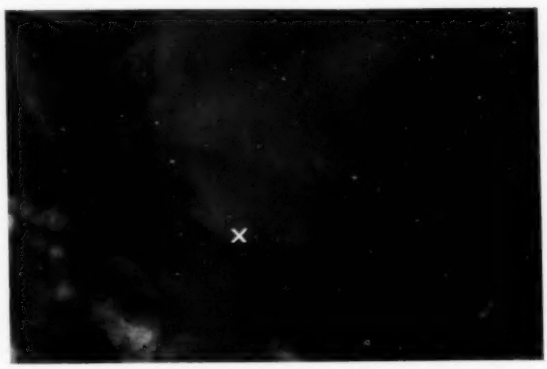


FIG. V.A.—Sella of skull shown in Fig. V. (in text). Cystic adamantinoma causing enlargement of sella and bitemporal hemianopia.

FIG. VII.—Latent acromegaly, with enlarged sella. The visual field of the right eye is shown in Fig. VI. (in text).

DR. PIJPER: ON MEASURING RED BLOOD-CELLS

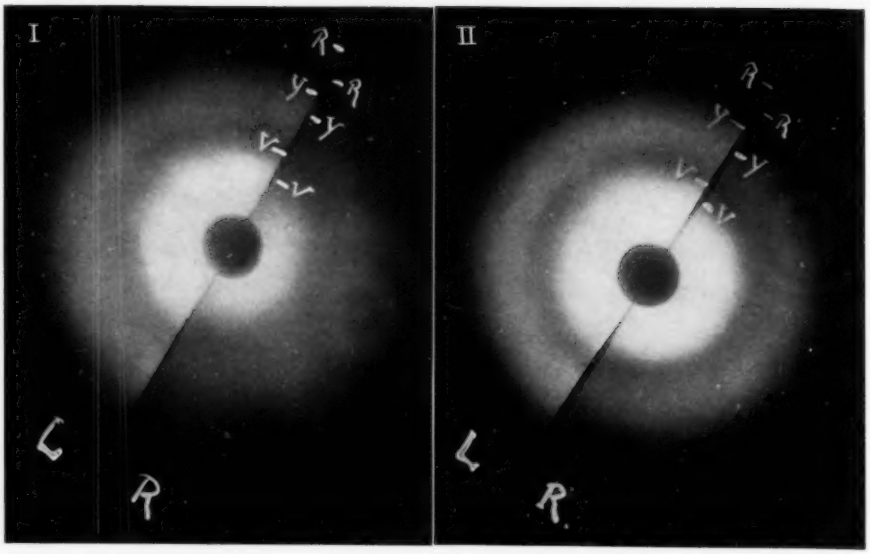
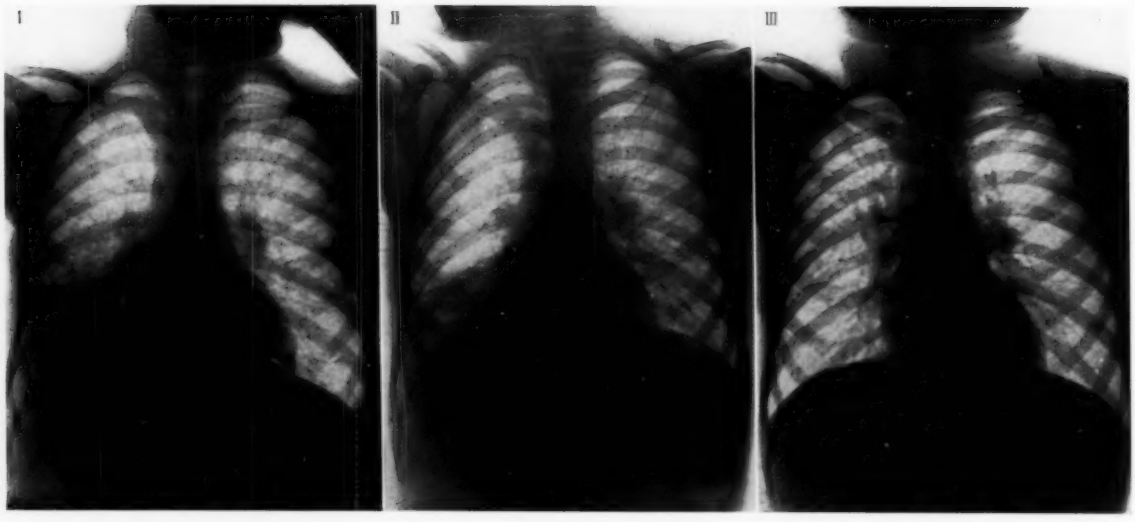
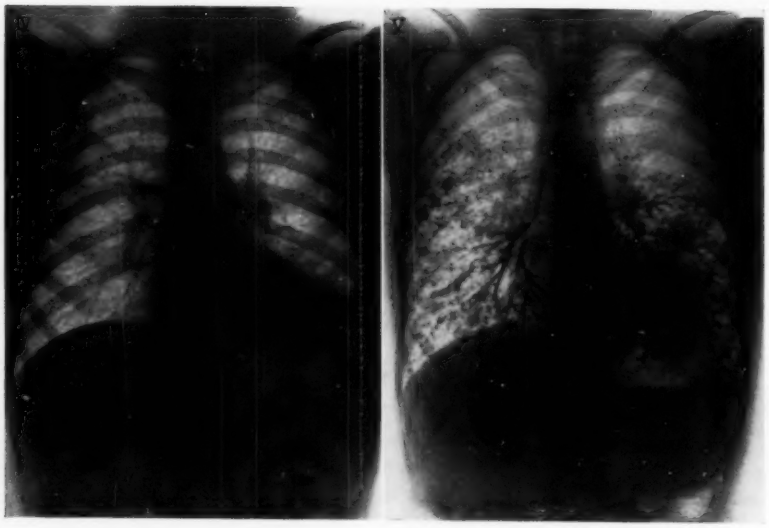


FIG. I.—Diffraction patterns of "normal" blood (left) and blood from a case of pernicious anæmia (right). V = inner edge of violet circle. R = outer edge of red circle. Y = yellow circle.

FIG. II.—Normal blood (left); blood from a case of subacute combined degeneration of the cord (right).



7.vi.34 21.vi.34 16.vii.34



1.viii.34 19.ix.34

DR. HALL: BILATERAL BRONCHIAL OBSTRUCTION

FIG. I.—Collapse of right lower and right middle lobes suggestive of lobar pneumonia.

FIG. II.—Continued collapse of same lobes.

FIG. III.—Condition after first bronchoscopy.

FIG. IV.—Result of obstruction to left main bronchus.

FIG. V.—Normal appearance after second bronchoscopy (lipiodol injection).

No attempt was made to measure the size of these particles since the methods commonly employed for this purpose (ultrafiltration and ultracentrifugation) require the use of a susceptible laboratory animal. It is sufficient, therefore, to state that the bodies found in suspensions obtained from rheumatic peri-

TABLE I

Case.	Clinical condition— Pericarditis.	Carditis.	Pneumonia.	Duration of illness.	Elementary bodies in fluids from— Pericardium.	Pleura.
1	Acute.	+	+	2 weeks.	+	No effusion.
2	None.	+	+	3 ,,	+	Contaminated.
3	Acute.	+	+	4 ,,	+	0
4	,,	+	+	5 ,,	+	+
5	,,	+	0	3 ,,	+	0
6	Subacute.	+	+	3 ,,	+	No effusion.
7	Chronic.	+	+	Several months.	0	0

Except in Case 4 post-mortem examinations were performed and the clinical condition was thereby confirmed.

cardial fluid were distinctly smaller than vaccinia elementary bodies when examined under the same optical conditions. It is fully realised that the utmost caution must be used in interpreting the results of microscopical examinations of this kind. We believe, however, that these findings can be regarded as significant when taken in conjunction with the other experimental evidence now to be described.

Agglutination of Suspensions Obtained from Pericardial Exudates

It has already been shown in a number of virus diseases that elementary bodies which on other grounds are regarded as the causal agents are specifically agglutinated by the corresponding antisera. This phenomenon was first described by Ledingham (1931) in the case of vaccinia and fowl-pox, and has since been demonstrated in varicella and zoster (Paschen, 1933; Amies, 1933). Such agglutination reactions provide additional evidence in favour of the view that elementary bodies represent the actual infective agents, and at the same time they form a useful method for studying the development of immunity to the virus in question. The application of this method of investigation to the present problem was obviously indicated. The results of preliminary experiments were encouraging and the method has now been given a fairly extensive trial.

The technique of preparing the suspensions has already been described. Owing to the small amount of antigen available it was necessary to employ a microscopic method of carrying out the agglutination tests.

Mixtures consisting of equal volumes of the antigen suspension and an appropriate dilution of the serum to be tested were set up as hanging drops, using an aluminium ring moist chamber in preference to a hollow-ground slide which is too shallow for this purpose. Each serum was usually tested in a series of falling dilutions from 1 in 4 to 1 in 128. Controls consisting of antigen with normal serum and antigen with saline were included in each test. The preparations were allowed to remain at room temperature (average 65° F.) and examined after 24, 48, and 72 hours. At these intervals the preparations were examined microscopically with transmitted light, using a 16 mm. objective and a ×10 ocular. A positive reaction was indicated by the appearance of small, irregularly shaped, highly refractile floccules. These were usually visible 24 hours after setting up the tests, but their appearance was sometimes delayed to 48 hours. The control preparations, consisting of antigen and normal serum or saline, appeared perfectly clear when examined under the same conditions.

In order to determine the nature of these floccules the hanging drop was transferred to a clean slide and examined by dark-ground illumination. It was then evident that the floccules consisted of aggregates of the small bodies of uniform size already identified in the pericardial suspensions.

RESULTS OBTAINED

The agglutination reaction as described above has been carried out on the sera obtained from 36 patients suffering from rheumatic disease, all of whom showed well established cardiac involvement. The series included acute, convalescent, and quiescent cases. A clear definition of these terms is necessary, since the results obtained with the agglutination test were found to depend on the degree of activity of the rheumatic process. An *active* infection was recognised by the presence of two or more of the following: pyrexia, tachycardia, extension of the cardiac signs, the presence of subcutaneous nodules, and failure to gain in weight. Significance was also attached to an increased erythrocyte sedimentation-rate, and no case was considered to be free from active rheumatism until the sedimentation-rate had fallen to a normal figure. Patients were regarded as *convalescent* when they had recently passed through a stage of acute rheumatism while under our personal supervision. In some of these patients, pericarditis, subcutaneous nodules, and arthritis had been present during the acute phase, while in others the presence

TABLE II

Agglutination Reactions with Rheumatic Suspensions and the Sera of Patients with Rheumatic Cardiac Disease

Serial No.	Suspension employed.	Agglutination titre of serum.	Clinical notes.
1	3 & 4	1/32	Active, nodules.
	4	1/32	8 weeks later.
	3 & 4	1/16	3 weeks later, acute pericard.
2	3	1/16	Active, nodules.
	4	1/32	6 weeks later, active, nodules.
3	2, 3, 4	1/32	Active, nodules.
	2	1/16	2 weeks later, active.
	4 & 5	1/64	3 months later, acute pericard., pleurisy.
4	3	Neg.	Active, nodules.
	4	1/8	2 weeks later, active.
5	4	1/16	Active, nodules.
6	4 & 5	1/32	,, ,,
7	3, 4, & 6	1/16	,, ,,
8	6	Neg.	Acute pericarditis.
	4	,,	2 weeks later; died a few days later.
9	4	,,	Subacute pericarditis, nodules.
	4	,,	1 week later; died a few days later.
10	4	,,	Active, nodules.
11	3 & 6	1/32	Convalescent.
12	,,	Neg.	,,
13	,,	,,	,,
14	,,	1/16	,,
15	3, 4, & 6	Neg.	,,
16	3	,,	Convalescent; recent nodules.
17	3	,,	Convalescent.
18	4	,,	Convalescent; recent nodules.
19	2	,,	Convalescent; recent pericard.
20	2	,,	Convalescent.
21	3	,,	Quiescent.
22	2	,,	,,
23	3	1/8	,,
24	3	Neg.	,,
25	3	1/4	,,
26	3	Neg.	Quiescent; recent tonsillitis.
27	6	,,	,, ,, ,,
28	3 & 6	,,	,,
29	,,	,,	,,
30	,,	,,	,,
31	,,	,,	,,
32	,,	,,	,,
33	,,	,,	Quiescent; recent tonsillitis.
34	,,	,,	,,
35	,,	,,	,,
36	,,	,,	Quiescent; recent tonsillitis.

The number assigned to the suspension corresponds to that of the case from which it was prepared. (See Table I.)

of an active infection was recognised by a combination of the signs and symptoms enumerated above. In this group of convalescent cases the blood was examined four to eight weeks after the cessation of the stage of activity. The group of *quiescent* cases consisted of patients in whom no signs of active rheumatic infection had been observed for many months. The results obtained are summarised in Table II.

From the results shown in Table II., it is evident that agglutinins could be demonstrated only at certain stages of the disease. The highest titres were obtained with the sera of patients in whom the rheumatic process had been active for a long period. Multiple subcutaneous nodules, indicating a wide dissemination of the infective agent, were a characteristic feature of the clinical picture presented by these patients. Even when relapses occurred and the infection developed into an acute pericarditis or pleurisy, as in Cases 1 and 3, the production of agglutinins was maintained. When, on the other hand, the disease steadily progressed to a fatal termination, possibly owing to a poor resistance on the part of the patient or as the result of a particularly virulent infection, the tests for specific agglutinins were negative. Positive reactions were only obtained in 2 out of 10 patients who were in the early stages of convalescence from active rheumatism and in only 2 out of 16 quiescent cases.

CONTROL EXPERIMENTS

During the course of the investigation each antigen was tested against a number of sera obtained from normal healthy persons and from patients suffering from various non-rheumatic diseases. Completely negative reactions were obtained with sera from the following conditions: 9 cases of syphilis (6 with a positive Wassermann reaction); 12 cases of zoster, all of which agglutinated a zoster elementary body suspension; 2 cases of active rheumatoid arthritis; 4 cases of active Still's disease; and 2 cases of streptococcal tonsillitis (taken 2 weeks after the attack).

As previously mentioned suspensions were prepared from pericardial and pleural fluids of non-rheumatic control cases. With none of these was a positive agglutination obtained with any of our known agglutinating sera.

The possible influence of hæmolytic streptococcal throat infections on the agglutination reaction was further investigated by testing 6 sera obtained from patients who were convalescent from scarlet fever. The blood was taken approximately three weeks after the onset of the disease. In 5 of these, there was no history of rheumatic disease and the sera failed to agglutinate the rheumatic pericarditis suspensions. In one case, however, the agglutination reaction was positive. When the patient was examined it was found that there had been persistent tachycardia during the third week of convalescence and that the temperature was slightly raised (99·6° F.) on the day on which the blood sample was taken. There was no evidence of cardiac disease, but the patient gave a definite history of "joint pains" and it was found that her mother suffered from mitral stenosis.

The following experiment also shows that streptococcal antibodies play no part in the agglutination reaction here described. Thirteen sera obtained from patients in various stages of rheumatic disease were tested for antistreptococcal agglutinins, using a suspension of hæmolytic streptococci ("Carter" strain) as antigen. Of these 13 sera, 2 agglutinated this suspension to a titre of 1 in 8, while the rest gave completely negative reactions. The same 13 sera were then tested with a rheumatic pericardial suspension. The 2 sera that contained antistreptococcal agglutinins gave a negative reaction, while a positive result was obtained with 4 other sera in which antibodies for streptococci had not been demonstrated.

It has already been mentioned that an increased erythrocyte sedimentation-rate was constantly present in those cases of active rheumatism in which a positive agglutination reaction was obtained. Increased velocity of sedimentation of the red blood-cells depends largely upon an increase of serum globulin and fibrinogen, and it therefore appeared necessary to exclude the possibility that such alterations in the blood protein content were responsible for flocculation of the antigen. For this purpose 5 sera obtained from women in the late stages of pregnancy were each tested against three different pericardial suspensions. The results were entirely negative.

It was also necessary to consider one further possible source of error. Since the human isoagglutinogens can be demonstrated not only in the erythrocytes and fixed tissue cells but also in saliva and urine (Yamakami, 1926), it was thought that they might possibly also be present in pericardial exudates. If this were so, the antigens prepared from pericardial fluids might contain these agglutinogens which would then react with the corresponding isoagglutinins, should these be present in the serum to be tested. Fortunately this serological complication did not occur in actual practice; examples of it would otherwise have been encountered among the control tests. This conclusion was confirmed by ascertaining the blood groups of 12 rheumatic patients whose sera had already been tested for agglutinins, the same sample of antigen being employed in each case. No correlation between the two reactions was found.

Discussion

The investigations described in this paper, although by no means exhaustive, are regarded by us as definite evidence in favour of the hypothesis that the infective agent of rheumatic disease is a virus. The striking similarity between the results obtained in the present study and those reported in connexion with such established virus infections as varicella and vaccinia-variola with regard to the isolation of elementary bodies and the agglutination of these by the homologous antiserum, lends considerable support to this belief. The final proof, however, must rest upon the demonstration that the bodies described in this investigation are capable of reproducing the disease in a susceptible animal. The number of viruses that have been successfully adapted to a foreign host is steadily increasing and further attempts to achieve this object in the case of rheumatic disease are indicated.

This new conception of the ætiology appears to offer an explanation of several facts in the pathogenesis of the disease which the older theories cannot account for. Acute rheumatism has long been recognised as a disease that shows a special affinity for certain tissues such as the endothelial lining of the heart, the blood-vessels, serous membranes, and connective tissue throughout the body. Furthermore, the submiliary nodule which is the fundamental basic lesion and represents the essential reaction of the tissues to the infective agent is characterised by an active proliferation of cells derived from the reticulo-endothelial system. A similar type of inflammatory lesion is equally characteristic of

vaccinia, for Ledingham (1924) and others have shown that this virus proliferates in tissues of mesoblastic origin and that the reticulo-endothelial tissue is the seat of primary attack and takes the chief share in repair.

The pulmonary manifestations of acute rheumatism are also of interest in this connexion. Naish (1928) and many others have stated that the changes which are sometimes present in the lungs are peculiar to rheumatism and quite unlike those found in the usual type of pneumococcal pneumonia. The hæmorrhagic character of the inflammation, with much proliferation of endothelial cells, thickening of the alveolar walls, and absence of much fibrin and polymorphonuclear cells, bears a striking resemblance to the condition found in influenzal pneumonia in man, and also to the pulmonary changes in swine influenza. We believe, in conclusion, that the evidence obtainable from a histological study of rheumatic lesions is more in accordance with the conception of a virus as the ætiological agent than with any other theory.

The characteristic properties of the infective agent of rheumatism cannot be closely paralleled with those of any known virus. Some of its characters, however, are shared by a number of virus agents. Such diseases as variola and mumps which run an acute course and confer a solid immunity to reinfection clearly have nothing in common with acute rheumatism. There are other virus diseases, however, such as herpes febrilis, in which the agent remains in the tissues for long periods and becomes manifest only when the general powers of resistance to infection are lowered. In this case the period of immunity following a clinical attack is comparatively short and the infective agent can be demonstrated in the nasopharyngeal secretion in the intervals between attacks.

Many other questions relating to the epidemiology of rheumatic disease, such as the significance of subclinical infections and the possibility of a true symbiotic relationship between the virus of rheumatism and hæmolytic streptococci, could be discussed in the light of this new conception of the ætiology. Such discussion, however, would be mainly speculative. We prefer, therefore, to confine ourselves at present to a simple record of the experimental findings in the hope that further research along these lines will eventually solve the problem of the causation of rheumatic disease.

Summary

1. The deposits obtained by high-speed centrifugation of pericardial fluid from cases of acute rheumatic pericarditis contain particles which morphologically resemble virus elementary bodies. Similar bodies have been found in the deposit obtained from one pleural exudate in association with rheumatic pneumonia.

2. Relatively pure suspensions of these bodies in formol saline have been prepared. These suspensions are specifically agglutinated by the sera of patients who are suffering from, and successfully resisting, an acute rheumatic infection. The sera of patients in whom the infection is quiescent fail as a rule to agglutinate these suspensions. Completely negative reactions were also obtained with the serum of normal persons and of patients suffering from various non-rheumatic infections.

3. On the evidence above summarised it is suggested that the bodies found in pericardial exudates represent the actual infective agent of acute rheumatism.

4. The importance of streptococcal infection as a factor in the ætiology of the disease is recognised. It is suggested that the lowered resistance produced by such infections enables the virus to enter the body or, if the virus is already lying latent in the tissues, allows it to assume active characters.

We wish to thank the medical staffs of several hospitals for placing their clinical material at our disposal. We are also grateful to Prof. J. C. G. Ledingham, director of the Lister Institute, and to Dr. David Nabarro, director of the pathological department of the Hospital for Sick Children, Great Ormond-street, for the help they have afforded us throughout this investigation.

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THE RELATIONSHIP BETWEEN ADENOMATA AND CANCER OF THE LARGE BOWEL*

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IT has been known for many years that there is a close relationship between so-called innocent adenomatous tumours and cancer, and that an adenoma which is at first innocent may be found at a later stage to have been replaced by cancer. Not infrequently careful microscopical examination of large adenomatous tumours by serial sections has shown that at one part of the tumour invasion of the deep tissues has taken place and malignant change occurred. This was pointed out by Dr. Cuthbert Dukes in 1926 [1] and by him and myself again in 1928.[2] While most of the observations have been made in connexion with adenomata of the large bowel, the same has been shown to be true of duct adenoma of the breast by Sir Lenthal Cheatle [3] and of adenoma of the stomach by Prof. Stewart.[4]

It seemed to me that valuable information might be obtained if the after-histories of a large number of cases of so-called simple adenomata of the large bowel could be traced during a number of years to see exactly what happened to the patients. It is very generally assumed that if an adenoma is removed adequately, and is found on microscopical examination

* A post-graduate lecture delivered at St. Mark's Hospital on Feb. 4th.

to exhibit no evidence of malignant change in any part of its structure, that nothing further is to be feared, and that the patient is cured in the true sense. But no real evidence has hitherto been available on which to base such an assumption, and as I shall try to show, it is as a matter of fact quite unjustified and false. The patient is by no means certainly cured by the removal of the adenoma, however completely its removal is carried out. It is probably true that the particular adenoma which has been removed will not return, but the changes in the epithelial cells which have resulted in the formation of the adenomatous tumour may still be present and other adenomatous tumours are liable to form in the neighbouring epithelium.

THE INQUIRY

I decided to attempt to trace the after-history of a large number of cases of simple, so-called innocent, adenomata of the rectum and colon, and to see what proportion of recurrences there were, and in what situations they occurred after, what is generally considered, adequate surgical procedures. Fortunately for many years I have made it a habit to examine all cases where a simple adenoma has been removed from the bowel at periodic intervals, both in hospital and private practice. It has thus been possible to study the after-history of 50 cases.

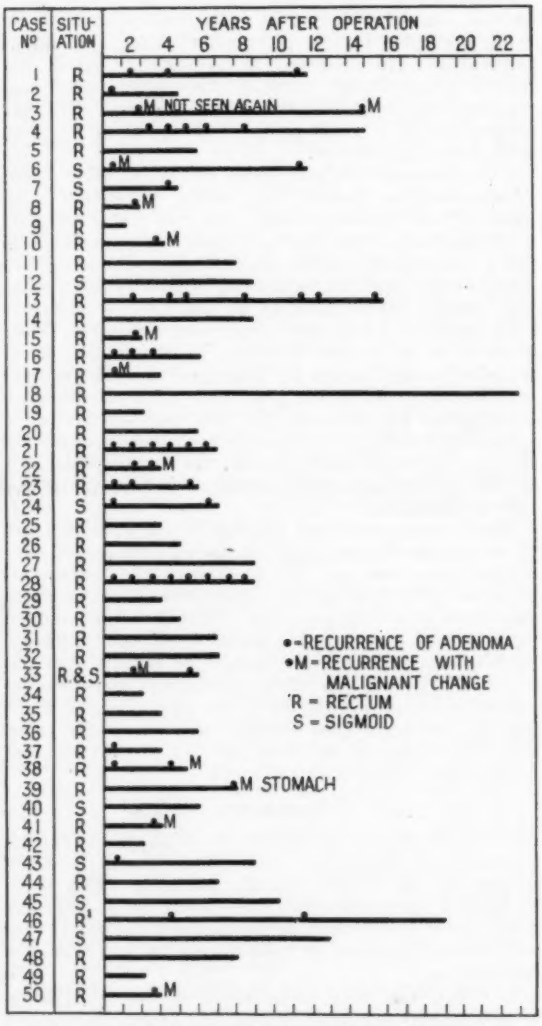
For the purpose of this investigation I considered it wiser to leave out entirely all cases of that curious disease adenomatosis, or multiple adenomata, where there are numerous tumours more or less throughout the whole colon, as adenomatosis has already been very thoroughly studied and appears to be a disease entirely of genetic origin, and although in the present state of our knowledge it is not possible to draw any very hard-and-fast distinction between cases of single adenomata and cases of adenomatosis, I feel that to mix all the cases together would not be helpful. Therefore, all cases of adenomatosis have been entirely excluded. Only those cases have been taken in which the original adenoma was adequately removed according to our modern standards by some surgical procedure, and where it has been possible to trace the happenings for at least a year afterwards.

The method of removing the adenomata has varied considerably. In those cases where the tumour has presented itself as a pedunculated polyp it has been removed by a wire diathermy snare, or by ligating the pedicle when this was possible. When the tumour has been large and sessile, it has been cut out with half an inch or more margin of healthy mucous membrane, either through the rectum or from behind after removing the coccyx and the wound in the rectum restored by stitching. In a few cases a local resection was performed and in some cases where the tumour was very large the rectum has been entirely excised by the usual methods. In all cases the original adenoma has been properly examined histologically after removal, generally by a series of sections, and its character as an innocent adenoma verified.

Most of the cases have been examined sigmoidoscopically at regular intervals, many of them every four months, for a number of years after the original operation, and the findings have been most carefully checked both clinically and pathologically. Some patients have, of course, refused to return for periodic examination, or have been unable to do so, but in a number of cases which have not returned the subsequent history has been obtained from the patient's medical adviser.

Out of the total of 50 cases there were 25 in which another tumour developed, and 12 where malignant tumours, adenocarcinoma, subsequently developed. In 25 cases there was no recurrence of any kind. In 13 cases other adenomata developed more than once in different sites. The average age of the patients was about 60. One of the cases counted among the recurrences is a patient who developed a cancer of the stomach seven years after removal of the original adenoma.

Some of the cases were very remarkable. Thus, one patient had no less than eight adenomata in different parts of the rectum during 15 years, while another had six in 14 years. One patient had seven adenomata in 6 years and another nine in 8 years. One patient after having two recurrences went 6 years and then developed another.



Fifty cases of adenomata in the rectum and sigmoid.

As will be seen, by a study of the accompanying chart, the proportion of cases in which other adenomata developed was very high; actually this occurred in about 50 per cent. It is too easily assumed that because an adenoma has been removed months or years before from the rectal mucosa, that the finding of another subsequent adenoma is due to a recurrence of the original tumour. I am convinced that such is not the case, but that the subsequent adenomata are almost always new primary tumours,

not parts of the first tumour. In this series of cases careful note was taken of the situation of the secondary adenomata, and it was almost invariably found that the secondary tumours were not in the same position as the original tumours that had been removed. In very many cases the secondary tumours were inches away from the original site, or on a different aspect of the rectum altogether. In some cases the secondary tumours were much higher up in the colon. A reference to the chart shows that in a large number of cases adenomata were removed which were proved to be innocent in character, but that subsequently, sometimes many years later, another tumour formed which was definitely malignant. This actually took place in 12 out of a total of 50 cases.

While I was well aware of the fact that adenomata were liable, if left alone, to change into malignant growths, it has been a surprise to find that there were such a large number of cases where patients have developed malignant adenomata subsequent to the removal of an innocent one. I think we are justified in saying that adenomata of the bowel epithelium are not innocent in any sense, and are merely a stage in the development of cancer.

An adenoma may grow to a very large size without becoming malignant. Some of those in this series covered an area of four or five inches, and some were as large as oranges, but were not malignant in any part. In a few instances, owing to the age of the patient, or other infirmities, very large adenomata have not been removed, but have been observed for a number of years and have not shown any signs of malignant change, while on the other hand comparatively small ones have been observed to become malignant tumours in a few months. Generally speaking, however, it has been my experience that small adenomata are very seldom found to be malignant, a certain optimum size seems to be necessary before a malignant change occurs.

It seems that once a patient has developed an adenoma in the rectum the mere removal of the tumour, however thoroughly it is done, is not sufficient to prevent that patient from developing another adenoma, or even from developing cancer.

When the entire rectum has been removed for an adenoma there has been no instance of the formation of a second primary tumour in this series of cases. The only cases where a complete excision has been performed are those cases where on account of the size or extent of the adenoma, the only feasible method of removal was by complete excision. The inference appears to be that complete excision of the rectum is the only effective way to rid the patient of adenomata, but although this may be the best method on purely theoretical grounds it is for many reasons seldom possible. This series, however, shows that if the patient is carefully examined regularly every four or five months secondary tumours can be detected in the very early stage when they can be removed with the cautery, or by burning them with fuming nitric acid, and that by such means patients can be protected from any serious development for very many years. In only one of these 50 cases in which this method was adopted, did the patient develop a malignant tumour, and in that one case the innocent tumour was in the rectum and the secondary one, which became malignant, occurred in the pelvic colon out of reach of the sigmoidoscope.

REMARKS

These cases seem to prove that an adenoma of the rectum, or colon, is not an innocent tumour in any sense and that in fact adenomata are merely a stage in the development of malignant tumours, and should be so treated. At a certain age certain cells of the bowel epithelium exhibit a tendency to undergo hyperplasia; in other words, they start to grow at a speed which is much in excess of the normal requirements of the tissue wastage and a tumour results. This tendency is not, however, confined to one cell or group of cells, but appears to be fairly widespread. With the result that the removal of one adenoma does not prevent the development of others.

I believe that what happens, when a tumour forms, is that a change or gene mutation occurs to start with in the nucleus of a single cell resulting in an excessive rate of reproduction of that cell as compared with the reproduction of normal cells of the same tissue. The adenoma result from the excessive reproduction of this single cell. The tumour is composed of normal cells differing, as far as we can observe, from other cells only in the fact that its cells are reproducing themselves too fast. This tendency for a mutation or change of their character to take place, is often however, present in a number of different cells in a fairly wide area. The exciting cause of the change may be due to genetic instability, or to some factor in the environment, and the fact that it has occurred in one cell does not prevent the same change from taking place later on in other cells.

It is becoming increasingly evident that more can be learnt about the problem of tumours by a careful study of adenomata of gland tissue than by a study of actually malignant tumours themselves. The tumour problem must be the same, or very similar for all true tumours. Indeed it is possible that essential difference between simple and malignant tumours is dependent upon their different rates of growth. In a paper just published, J. C. Mottram [5] describes the results of a study of the rate of growth of tar warts in mice and postulates the possibility that the growth rate decides the question of innocency or malignancy. Where the growth rate is slow the tissues are able to set up a protective reaction against the process, but when the growth rate is fast this protective reaction breaks down and invasion of other tissues by the rapidly reproducing cells take place.

From a practical point of view local removal of the tumour would appear to be sufficient *if* the patient is carefully watched at four-monthly intervals during the next five to ten years, so that fresh tumours can be removed at once before they have had an opportunity of becoming malignant. But unless the patient is kept under observation in this way the development of other tumours is very likely to occur unobserved. The frequency of such a happening appears to be about 50 per cent., and a considerable danger exists of malignancy supervening.

Only one case that was kept under observation in this series has developed a malignant growth, and in that instance it was in the colon too high up to be seen. It may, I think, be justly claimed that with this exception, a large number of the patients in this series of cases have been prevented by surgical treatment from developing cancer.

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ON MEASURING RED BLOOD-CELLS

WITH SPECIAL REFERENCE TO A NEW DIFFRACTION APPARATUS

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(WITH ILLUSTRATIONS ON PLATE)

THE accompanying figures are reproduced from photographs of coloured semicircles as they appear on the ground-glass screen of the new diffraction apparatus for measuring red cells to be described here. On the left in both pictures are the diffraction semicircles produced by "normal" blood; on the right in Fig. I. are semicircles from a case of pernicious anæmia, and those in Fig. II. are from a case of subacute combined degeneration of the spinal cord. The differences between these three types of diffraction patterns are obvious enough, even in these black-and-white photographs. They are very striking when seen in their full colours in the apparatus. The patterns produced by secondary anæmias and by microcytic anæmias are quite different again from those reproduced here.

ROUTINE AND RESEARCH

A "routine" blood examination usually consists of hæmoglobin estimation, red cell count, and microscopic inspection of a stained smear. Additional investigations on the red cells, including red cell measurements, are usually regarded as "research."

Price-Jones' work[1] established the value of red cell measurements. But for its laboriousness such a microscopic method would have become "routine." But nobody can afford to spend a couple of hours measuring red cells every time a blood smear is made. Thus the paradoxical situation has arisen that measuring is mostly done when it is least needed. It is used to confirm, not to inquire. It has been said that a diagnosis of pernicious anæmia often comes as a surprise.[2] The truth of this is brought home to one when red cell measurements are a routine measure. Without red cell measurements the differential diagnosis of anæmias outside highly specialised clinics depends chiefly on calculation of the hæmoglobin-index and inspection of a stained smear, of which the former is subject to a 20 per cent. error at least, while the interpretation of the latter is largely a matter of opinion. Feeble as this method is elsewhere, the calculation of the "index" breaks down completely in countries like the Transvaal, where many people live in perpetual sunshine at an altitude of five or six thousand feet, with frequent and sudden descents to, and returns from, sea-level, in the shape of rapid trips to the coast or down a mine. Counts of 6 million red cells in anæmic persons are not at all unusual here.

The very laboriousness of measuring red cells microscopically and plotting the results seems to impress many people as being a guarantee of accurate results. That method of fixing and staining, source of light, properties of substage condenser, quality and especially aperture of objective, fineness of pencil point or thickness of graduations of micrometer, boredom and personal equation of the observer all affect the results is too often forgotten. In fact, a Price-Jones curve consists of two curves superimposed. One is the curve of actual diameters, the other is the "normal curve of error." These remarks do not attack the usefulness of the method, they are merely meant to counteract the growing but unwarranted tradition that a Price-Jones curve is the last word in accurate and reliable research. Critical microscopists know better, and the hardly measurable does not become more measurable by spending more time over it.

THE DIFFRACTION METHOD

The diffraction method of measuring red cells, which I first described in 1919,[3] and applied diagnostically in 1924,[4] was greatly improved by me in 1929.[5] The criticisms which are levelled against the method are all concerned with the admittedly somewhat primitive technique of 1924. This is largely due to the fact that after 1924 from various sources several apparatuses were put on the market, embodying this simple technique, sometimes even without an understanding of its leading principles. The improved method of 1929, requiring more insight and more elaborate apparatus, did not lend itself to this popularisation. Except for the work of Ponder[6] and Miller[7] nothing new was added to the method by all these efforts at popularisation and simplification. They may be regarded, however, as an indication that the need for a quick and reliable method of measuring red cells is universally felt.

IMPROVED DIFFRACTION METHOD

The full advantages of the improved diffraction method, as used by me, and a few others, with complete satisfaction, are now available in a new and self-contained apparatus. It is built on the lines laid down by me in 1929, but owes its compactness to the ingenuity of Prof. Siedentopf, of the firm of Zeiss, who interested himself in the method, and after thorough investigation designed a suitable apparatus.* This has the advantage that the source of light is built-in, and once it has been put up, which is a simple matter, no further adjustments are required. There is a horizontal stage, on which two blood smears can be placed. Their diffraction patterns, produced by about a million cells, appear on a ground-glass screen which forms the top of the apparatus. A partition placed in the middle of the apparatus cuts out half of each diffraction pattern, and the remaining semicircles appear in close apposition on the screen, facilitating comparison, as illustrated in Figs. I. and II.

READING RESULTS

Each diffraction pattern consists of a bright white centre, surrounded by an orange ring, and then follow the colours of the spectrum in natural order, starting with violet and finishing up with red. After that green and red circles alternate with one another. For practical purposes the cardinal points are the positions of the inner edge of the violet circle (V), of the outer edge of the red circle (R), and the position of the yellow circle (Y).

Normal blood smears show little variation in the positions of these three rings. The limits of what might be called normal variation are given in the Table. The meaning of this individual variation has been discussed elsewhere.[8] For routine work one compares the diffraction rings produced by a blood smear from a healthy person giving average readings with those produced by the patient's blood smear. This will give information as to the mean diameter of the patient's red cells, and also as to the degree of anisocytosis and sometimes of poikilocytosis present in his blood.

* The apparatus is sold by Messrs. Carl Zeiss, Jena, as "Blutzellenprüfer nach Dr. Pijper" or "Dr. Pijper's Blood-cellitester." A spečial booklet issued with the apparatus gives full details and working directions.

The principles on which this is done have been outlined before.[4 5] The reliability of this information has been amply confirmed by me in actual clinical practice during the past seven years, and also by control microscopic measurements undertaken for this purpose.[9] For the proper use of the diffraction method it is essential to adhere to these principles

Rings in mm.	Pernicious anæmia.	Normal.	Secondary anæmias.	Microcytic anæmias.	Hæmolytic icterus.
V	22–29	33–35	28–32	35–38	39–43
Y	50 and less	52–56	55–56	57–61	63 and more
R	58–64	65–70	67–77	74–78	90 and more

and to abide by the rules laid down in connexion with this apparatus for reading results. No satisfactory results can be obtained by merely estimating the size of a "halo" or by measuring the diameter of a single coloured ring, chosen at random. The range of variation of the three coloured rings mentioned above (V, Y, and R) in different anæmias is given in the Table. It is not necessary to make actual measurements in every case. After some practice the direct comparison with normal blood enables one to get the required information simply by glancing at the diffraction patterns. Thus one pattern will give a diagnosis of microcytic anæmia, another will be characteristic of pernicious anæmia, while a third will exclude pernicious anæmia and make a decisive diagnosis of secondary anæmia. Again, there is a difference between the typical pattern of pernicious anæmia with pronounced anæmia and those forms where nervous symptoms predominate and changes in the blood are hardly detected except by red cell measurements. Measurements of the circles are performed directly by means of a pair of compasses on the ground glass along the black dividing line between the two patterns, or indirectly by placing a piece of transparent paper on the ground glass and marking the circles on the paper, with subsequent measurement. This last method has the additional advantage of giving permanent records which can be attached to the hæmatological report.

It is convenient to divide pathological diffraction patterns into three types, depending on the facts that the diameter of the yellow circle (Y) varies in inverse ratio to the mean diameter of all the cells, and that the distance between V and R increases as anisocytosis increases. Poikilocytosis, if pronounced, interferes with the regularity of the patterns and produces watery colours.

TYPE 1.—All three rings small; for measurements see the Table. Distance between V and R *relatively* large. This pattern means macrocytosis and pronounced anisocytosis. This is typical of pernicious anæmia. In the anæmic form there is often so much poikilocytosis that the colours are watery (Fig. I.). In the nervous form there often is little poikilocytosis and the colours are bright (Fig. II.).

TYPE 2.—Yellow ring of normal diameter, which means normal mean diameter of cells; for range of variations see the Table. Ring V is smaller than normal, ring R is larger than normal. This means that there is more anisocytosis than normal; its degree can be read off from the distance between V and R, as compared with the normal pattern on the left. The colours may be somewhat diffuse, on account of their being spread out over a larger area, but they only become watery when there is distinct poikilocytosis as well. This is the pattern I find in secondary anæmias, whatever their causation (infections, hæmorrhages, other diseases).

TYPE 3.—Counterpart of Type 1. All three rings larger than normal, and distance between V and R often relatively increased, as a result of anisocytosis; for range of variations see the Table. This is the pattern I find in microcytic anæmias, and also in hæmolytic icterus. Untreated cases of the latter disease during periods of exacerbation may show truly enormous rings. Extirpation of the spleen, or quiescent periods, may reduce them to more normal size.

In all three types comparison of the diffraction patterns produced by blood smears taken at intervals affords probably the most sensitive and quickest method of following the progress of the case.[10]

CALCULATION OF RED CELL DIAMETERS

The mean diameter of the red cells in all cases is calculated by taking the diameter of the yellow circle (Y) in millimetres, subtracting one millimetre (for the image of the source of light), and dividing into 395. The result is the mean diameter in microns. Example: the yellow circle measures 54 mm.; dividing 395 by 53 gives 7·5 microns.

It is possible, by means of a special formula,[5] to express the degree and quality of anisocytosis in diameters of red cells. In practice this is hardly felt to be necessary. At most, one calculates the mean cell diameter and reads the anisocytosis from the relative position of the three rings.

DISCUSSION

It is not always possible to say that a given diffraction pattern is definitely pathological. There are transitions between the range of normal variation as given in the Table, and definitely pathological states. Thus a yellow circle of 52 mm. (red cell diameter = 7·7 microns) is still normal, and one below 50 (red cell diameter = 8·1 microns) is definitely pathological, but values between these two figures may have various meanings. There exist macrocytoses of varying degrees of different origins, which are not very well established at the present time, and will probably become better known through more universal use of red cell measurements.

It is not claimed that the improved diffraction method is a short cut to hæmatological diagnosis. It is not suggested that the usual routine measures should be abandoned, but red cell measurements have proved their worth in research, and thus have become essential for routine examinations. They give information which no other method can give. That they have not come into their own is due to the fact that pathologists thus far have not had a satisfactory method of ascertaining them. It would be easy to extract a series of cases from my own laboratory records alone where the diffraction method supplied a diagnosis when other measures had failed, more especially in the nervous form of pernicious anæmia, but also in acholuric jaundice. Apart from those instances in which valuable positive information is gained, there are other instances where application of the diffraction apparatus in this form permits the immediate exclusion of a suspected diagnosis. A diffraction pattern of Type 2 or 3, for instance, never occurs in pernicious anæmia. Patients with a diffraction pattern of Type 2 should receive the benefit of a further investigation so as to lay bare the cause of their secondary anæmia.

It takes very little time or trouble to become conversant with the workings of the apparatus, and afterwards only a few seconds to secure information as to diameters of red cells in every blood smear dealt with. The importance of this information can only be appreciated by actually using the method,

which, however, is not meant to be used to the exclusion of other methods. For this reason the apparatus is not intended so much for the busy practitioner as for the clinical laboratory, where the workers who, so far, have not had a method that was satisfactory for practical purposes can fit its results into other findings.

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Clinical and Laboratory Notes

BILATERAL BRONCHIAL OBSTRUCTION

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(WITH ILLUSTRATIONS ON PLATE)

BRONCHIAL obstruction, other than by carcinoma, is beginning to occupy the attention of physicians rather more than formerly, and certain syndromes are becoming better known. It has long been recognised, for example, that complete obstruction produces collapse of the lung peripheral to the block, but hitherto it has not been generally understood that obstruction which is not quite complete is sometimes associated with a sort of valve action, with emphysema of the lung supplied by the bronchus. The following case illustrates both these sequels to blockage.

The patient was a boy aged 5, who, a year before admission had had a pneumonic condition of the left lower lobe and several subsequent mild attacks of bronchitis. He was admitted to the Royal Chest Hospital on the third day of an illness in which the chief symptoms were extreme dyspnœa and pain in the abdomen. Clinically this was a case of right lower lobe pneumonia, although no bronchial breathing was heard, and radiography seemed to confirm this diagnosis. (Fig. I. on Plate.) Progress was not satisfactory, however, and a later radiogram (Fig. II.) showed some collapse of the right middle and lower lobes. A foreign body was suspected and on the twenty-sixth day of his illness he was bronchoscoped by Mr. A. M. Zamora, who removed a piece of peanut. The left bronchus was not inspected. X ray examination several days later showed almost complete re-expansion. (Fig. III.)

He still continued coughing, showing signs of bronchitis, and some weeks later a Mantoux test (0·0001, OTB) was done, this being followed in 36 hours by a marked local reaction, extreme dyspnœa, and high fever. Examination showed hyper-resonance of the left lung except at the base and complete absence of breath sounds. A diagnosis of left bronchial obstruction was made and it was thought to be due to swelling of the mediastinal glands as part of the tuberculin reaction. Radiography showed no enlargement of the glands, but it showed collapse of the left lower lobe. (Fig. IV.) The child gradually recovered, although the breath sounds in the left chest remained weak and he was discharged from hospital; two days later he was readmitted in exactly the same condition as that following the Mantoux test. He was again bronchoscoped by Mr. Zamora, who this time removed a pedicled granuloma from the left main bronchus. Recovery was rapid and the child has been well ever since. A lipiodol radiogram shows a normal bronchial tree. (Fig. V.)

The sequence of events is interesting: (1) a pneumonic condition of the left lower lobe a year before admission, possibly due to obstruction by a granuloma; (2) the inhalation of a peanut, producing complete obstruction of the right lower bronchus with collapse of the right middle and lower lobes; (3) removal of the peanut; (4) complete obstruction by a granuloma of the left lower lobe bronchus, with collapse of the lobe and incomplete obstruction of the left upper lobe bronchus with emphysema of the upper lobe; (5) removal of the granuloma; (6) bronchial tree normal on lipiodol examination.

STREPTOCOCCAL SEPTICÆMIA TREATED WITH ANTITOXIN

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A Mongol boy aged 13 was admitted to the hospital at Stoke Park Colony suffering from a typical attack of acute gastro-enteritis.

Two days later, following a rigor, the temperature rose to 105° F. and a small area of cellulitis was noticed upon the front of the left leg. The stools, which like the vomited material had been grass-green at the onset of the attack, were now normal in colour but still relaxed. Bacteriological examination of urine and fæces gave a negative result, but the urine contained a trace of albumin. The patch of cellulitis rapidly increased in size and was followed by a similar one on the dorsum of the left foot. Pus formation was slow, and meanwhile new areas of cellulitis appeared on the dorsum of the right foot, at the left elbow, and on the inner side of the right knee. Six days after admission to hospital the patient showed signs of a left lower lobar pneumonia. At the end of the second week diminished breath sounds at the same situation suggested the presence of fluid, and aspiration produced 7 c.cm. of blood-stained purulent fluid. On the same day the superficial abscess on the dorsum of the left foot was incised. Direct films and cultures from the pus in each case showed streptococci. An intramuscular injection of concentrated streptococcal antitoxin (scarlatina) 4 c.cm. was given the same day and continued in the same dosage twice daily.

During the third week the pleural cavity was emptied three times by syringe. On the first occasion 40 c.cm. of pus were withdrawn, 30 c.cm. on the second, and 6 c.cm on the third and last occasion, one week after the original needling. The pus obtained at each aspiration gave a pure culture of streptococci. Thereafter the lung expanded well, breath sounds returned, and there were no furthe signs of fluid. The areas of cellulitis formed abscesses and these were incised and drained as pus formed. Again the pus in each case gave pure cultures of streptococci.

During the fourth week, after the temperature and pulse-rate had settled, the antitoxin was reduced to 4 c.cm. once daily. It was suspended altogether during the fifth week, but recommenced during the sixth owing to the formation of a deep-seated abscess of the upper arm. This was drained and 4 c.cm. were given twice daily for a further six days. In all, five abscesses were drained and two areas of cellulitis resolved without abscess formation. The patient was discharged from hospital eight weeks after admission.

In this case the streptococcal infection apparently originated in the alimentary tract; the pneumonia and empyema arose during the course of the septi cæmia. One week's treatment by aspiration and anti toxin sufficed to clear up the empyema. The time taken for the first abscess to heal completely after incision was 14 days. The average time required for the healing of four abscesses which later required

incision was seven and a half days. Two of these latter were deep-seated.

Concentrated antistreptococcal serum may be given to children over a long period and in large amount. This patient received 136 c.cm. without any evidence of serum sickness. Urticaria appeared during the third week when the dosage was 8 c.cm. daily, but disappeared spontaneously in 24 hours.

I am indebted to Mrs. Burden, warden of Stoke Park Colony, for her kindness in paying the expenses of this treatment, and to Prof. R. J. A. Berry, director of medical services, for permission to publish the case.

POLYRADICULONEURITIS WITH ALBUMINO-CYTOLOGIC DISSOCIATION OF THE CEREBRO-SPINAL FLUID

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THE condition described by French neurologists as polyradiculoneuritis appears in the initial stages to be a very grave illness, but has a benign course and carries a reasonably good prognosis.

A man aged 55, never previously ill, got soaked through on his way to work on May 29th; he had to travel by train for several hours, shivered and became feverish. The next day he felt unwell. On the third day he woke up with pains in his back and neck, arms and legs, and with paræsthesiæ in the limbs. It was a great effort to walk, and weakness increased daily. His temperature, however, was normal from the third day onwards. He was admitted to hospital on the seventh day, with slight rigidity of the neck and great tenderness to pressure over the brachial plexuses on both sides, and on the nerve trunks of the extremities. Lasègue's sign was present on both sides. The pulse-rate was 84, regular, and the temperature 36·4° C. The pupils reacted well and nothing abnormal was found in the ears, sinuses or elsewhere, except for a slight reddening of the throat.

During the next ten days the complete nervous syndrome of bilateral facial palsy and quadrilateral paralysis appeared. Muscular hypotony was accompanied by loss of tendon reflexes, and a quantitative diminution of sensibility to electric currents. The paresed peroneal muscles showed a partial reaction to degeneration. His muscular weakness compelled him to stay in bed, where he had to be fed by a nurse, as the only movements he could carry out were feeble ones of the shoulders and thighs. The sphincters were not affected. He remained in this condition for five weeks, and then the pareses disappeared gradually in the order in which they had developed; the facial palsy first, then that of the arms, and finally that of the legs. Ten months after admission he was discharged almost recovered, having only a very slight weakness of the peronei on both sides and absence of both knee-jerks.

An important diagnostic point was the marked excess of albumin without high cell count in the cerebro-spinal fluid. Lumbar puncture was performed three times; five cells were found. Pandy's, Nonne-Apelt's, and Weichbrodt's reactions were all strongly positive. The gold reaction was at first, 0112331000; later, 0135552100; and finally, 00011000; and the benzoin reaction was 2202 the first time, but negative the second and third times. The Wassermann reaction was negative in both blood and cerebro-spinal fluid, and cultures from both were sterile. He was treated by artificial pyrexia (typhoid vaccine, &c.) and by galvanotherapy and massage.

Guillain-Barré [1] described this syndrome for the first time in 1916. They said that the course was benign, but Margulis [2] and others showed that it might be subacute. The condition seems to be due to an unknown virus, probably filtrable. It has been described as secondary to osteomyelitis, epidemic parotitis, and other diseases, but recently these nervous complications have been ascribed to a neurotropic virus rather than to the primary disease. Popek,[3] however, does not agree. In our case the long exposure to cold and damp seems to have had some ætiological significance. We were able to give a favourable prognosis, though the patient was still very ill, as soon as we had correctly diagnosed his condition. The differential diagnosis is therefore of considerable practical importance.

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MEDICAL SOCIETIES

MEDICAL SOCIETY OF LONDON

ANNUAL ORATION

Sir William Willcox delivered the annual oration of this society on May 13th, and took as his subject

Toxic Drugs: their Use and Misuse

During the present century, he said, the linkage between chemical constitution and pharmacological action has been so closely studied that the pharmacologist can to some extent deduce the therapeutic effect of an organic compound. He can also foretell what variations in action follow modification in structure: thus in research on barbituric acid derivatives the substitution of an ethyl group by an allyl, phenyl, or other radical leads to definite variation in pharmacological action. The result of such changes has been that enormous numbers of drugs of organic type have been introduced, and sometimes their admission has been too hasty. The borderland between full pharmacological effect and a toxic or poisonous action is often narrow, and one should be chary of prescribing drugs unless one has personal knowledge of their safety in use. A glowing advertisement does not relieve one of responsibility.

In 1934 an expert Committee (Poisons Board) was appointed with an advisory capacity in regard to the additions to the Poisons List and regulation of supply of substances having a toxic as well as a therapeutic action. In the report of this Board, which is to be issued, regulations will appear which will limit the supply of certain drugs of powerful therapeutic action to medical prescription. The public will be unable to purchase these drugs on their own initiative and their use will therefore be under medical supervision and control.

TOLERANCE AND INTOLERANCE

One of the most important functions of the liver is to protect the body against exogenous poisons such as drugs, and also against the complex substances formed during digestion and metabolism. When absorbed by the alimentary tract such poisons are conveyed by the portal vein to the liver which acts as the first line of defence; when they are introduced into the general circulation (e.g., by injection), the liver absorbs much of them from the blood stream and so protects the other tissues of the body. The liver in this way bears the brunt of the attack and in so doing its cells may undergo damage (cloudy swelling, fatty degeneration, or even necrosis). It is

known that the presence of glycogen in the liver cell increases its resisting power to poisons, and it is therefore advisable that glucose should be taken freely within a few hours of the administration of a toxic drug, such as a general anæsthetic or arsenobenzol derivative. In cases where the liver has undergone necrosis and life persists some days after the taking of the poison the cause of death will be auto-intoxication from hypofunction of the liver (hypohepatism) and little or no poison may be found in the body.

If a person is allergic a toxic drug in normal dose may have an enhanced and even dangerous effect. A history or evidence of defect in liver or kidney function, the presence of some intercurrent infection or of some toxic focus of infection, a highly sensitised nervous system—all these suggest the likelihood of allergy. Hence these are all points which require careful consideration before the administration of toxic drugs. Certain persons, moreover, show a special sensibility or idiosyncrasy to a particular drug (quinine, belladonna, morphine, iodides, or arsenobenzol compounds), so that toxic symptoms arise from even small doses. The continued administration of certain drugs (morphine, heroin, cocaine) may, on the other hand, produce a tolerance to very large doses; but such tolerance may suddenly be lost, owing to intercurrent infection for example, so that the customary large dose becomes a dangerous one. In the case of many toxic drugs such as the barbiturates, or the quinoline group (cinchophen), tolerance is never established and an overdose is always a dangerous dose.

SOME TOXIC DRUGS

Morphine and Heroin are invaluable, and timorous prescribing is more likely to lead to addiction than the employment of adequate amounts. Morphine may be generously given for organic disease and the comfort of the patient ensured provided that measures are taken for dealing with the cause of the symptoms. The use of morphine and heroin for psychical symptoms, however, is attended with danger of addiction. Furthermore these drugs are poisons to the liver and kidney, and if there is any evidence of defective function of these organs such as jaundice, or suppression of urine, even small doses are dangerous. In these circumstances minute doses, such as gr. 1/20 8-hourly, may give a full therapeutic effect.

Eukodal, Dicodid, and Dilaudid are recently introduced substitutes for morphine and heroin. The claim that they are free from risk of drug addiction has not been established, since several examples of addiction from their use have come to the speaker's notice.

Arsenobenzol compounds of the salvarsan and neosalvarsan type are perhaps the most valuable of modern therapeutic discoveries, but care is essential if toxic accidents are to be avoided. Thus impairment of function of the liver and kidney, and the presence of acute cerebral lesions of syphilitic type would be contra-indications for use. It must be remembered that an intravenous dose is not fully excreted until a fortnight has elapsed, so that the giving of full doses weekly is likely to give rise to toxic symptoms after a few doses. Accordingly when weekly doses are given they should be submaximal. Glucose premedication is a wise procedure. There are patients, moreover, who have an idiosyncrasy to aresenobenzol compounds.

Antimony.—Organic preparations of antimony and the potassium and sodium tartrates of this element have been used with success for tropical diseases such as kala-azar, bilharzia infections, and trypanosomiasis. The same precautions as for arsenobenzol compounds are indicated. A countess's fatal administration of Dr. James's fever powders (consisting of a full dose of potassium antimony tartrate) to her butler last century led to the comment that "there are more elements for success in the treatment of illness than a well-stocked medicine chest."

Bismuth preparations given intramuscularly and subcutaneously have valuable uses in the treatment of syphilis. There is a risk of severe exfoliative dermatitis in some allergic cases and the slightest sign of any skin reaction is an indication for complete discontinuance.

Gold.—Organic compounds of gold have a limited but useful place in the treatment of tuberculosis of lung, skin, and other organs. They have been recently introduced for the treatment of rheumatoid arthritis, but the risk of severe exfoliative dermatitis, occurring in not a few cases, is a warning for the utmost care in their employment. Other safer methods of treatment for chronic arthritis are preferable and more efficient. A few cases of toxic jaundice have been reported after the use of gold preparations.

Mercury.—Mercurochrome, an organic compound of mercury, has been used for septicæmic infections, but its use is not free from risk and has fallen into abeyance. Novasurol and Salyrgan are organic compounds of mercury having a powerful diuretic action when given intravenously. The toxic effect of mercury on the kidney calls for meticulous care.

Quinoline derivatives such as cinchophen (also known as Atophan, Agotan, Phenoquin, Atophanyl, Atoquinol) have been much employed for the treatment of gout and rheumatic conditions. They increase excretion of uric acid but sometimes even in small doses, such as grs. 5 three times daily for a week, they have a powerful toxic action on the liver, and fatal toxic jaundice has resulted. The use of these quinoline derivatives should be limited to carefully chosen cases, and their purchase by the public except under a medical prescription should be prohibited. Other allergic manifestations of the quinoline derivatives are nausea, vomiting, skin rashes, hepatic discomfort, and slight icterus.

Dekrysil is dinitrocresol, a drug recently put on the market in this country, and is similar to dinitrophenol which has been extensively used in America. Both increase the basal metabolic rate and indirectly cause loss of weight or "slimming." They are such powerful poisons to the liver and kidney cells that they should be withdrawn from the list of therapeutic remedies.

Coal-tar derivatives.—The human body seems to have a natural aversion to many of these, and to prefer similar compounds when produced by nature's processes. Thus in the early use of salicylates the natural product was commonly prescribed in place of the derivative from coal-tar; but the purity of the artificial products has been so perfected that there is now little if any difference between the two. It was formerly stated that the higher derivatives of the coal-tar or aromatic compounds were less toxic than the lower ones. This statement is true as regards corrosive action on the mucous membranes, but not as regards toxic action on the liver and kidneys. Some of the higher derivatives, such as the quinoline group, are powerful liver poisons, and others might be cited which have a much more toxic action in this respect than is supposed. It is interesting to note that complex aromatic compounds of vegetable

origin such as quinine, cinchonine, and quinidine, have comparatively little toxic action on the liver and kidneys. Quinidine and its salts when introduced were regarded as dangerous toxic drugs, but experience has shown that their careful use is not attended with toxic manifestations.

Thallium acetate is another drug of such powerful toxic action that its use in medicine would be wisely abandoned.

Nirvanol, an organic preparation introduced a few years ago for the treatment of chorea, produces such toxic effects that the remedy may be worse than the disease. It is little employed at the present time in this country.

Aspirin is one of the most valuable and safe of simple remedies. Certain persons have an idiosyncrasy to it, as shown by tachycardia, urticaria, or digestive disturbances, and by these it should be avoided. Phenacetin and phenazone may be classed with aspirin as regards their uses and dangers.

Amidopyrin (Pyramidon) has been largely used, and is in most cases non-toxic. Recently a number of cases of agranulocytosis following its use have been reported, so that the indiscriminate purchase by the public is undesirable. Agranulocytosis has been found to follow the taking of barbituric acid derivatives in several reported cases.

Basal Anæsthetics.—The aim of these drugs is to produce a light anæsthesia of short duration, or a condition of mild narcosis and amnesia so that a much smaller amount of a general anæsthetic will be required. Avertin is in experienced hands perhaps the safest of them, and is especially useful in cases of highly nervous temperament (e.g., in hyperthyroidism). It must be remembered, however, that it belongs to the halogen group of the paraffin hydrocarbons, and has toxic effects similar to those of chloroform. In other words, it has a toxic action on the liver. Where hypohepatism exists it either should not be used or should be given in much reduced dosage. For example, in gall-bladder operations a half dose will produce a definite amnesia and enable the operation to be carried out under gas-and-oxygen with safety. Evipan intravenously produces a short and light anæsthesia, and is useful if contra-indications be carefully considered. Nembutal, Amytal, and Pernocton, given by mouth, have been extensively used, but should be avoided if there are indications of any allergic condition or idiosyncrasy. In hyperthyroidism a dangerous susceptibility may occur. Suppression of urine has also followed administration of this group of drugs as basal anæsthetics, and care must be taken that the kidney function is normal.

Basal anæsthesia has found a useful place in modern therapeutics, but the toxic action of the drugs employed calls for careful investigations into the possibility of any special susceptibility to their effect.

Hypnotic Drugs.—In mild cases of insomnia where drugs are needed it is well to be content with the simple non-toxic hypnotics whose action is well known. The sulphonal group of drugs, such as sulphonal, trional, tetronal, are effective hypnotics, but their slow absorption and delayed action has caused them to be replaced by more rapidly acting hypnotics such as the barbituric acid derivatives. The sulphonal group are toxic, and if given daily over long periods may by their delayed absorption give rise to cumulative effects and serious poisoning. At the present time their use is largely confined to asylum practice.

The barbituric acid derivatives are powerful hypnotics with rapid and certain action. During recent years they have perhaps been the most commonly employed of all hypnotics in cases of severe insomnia, and at least thirty are in use to-day. Because of their effective hypnotic action the margin between the therapeutic and toxic dose is small. The risk of habit formation or addiction is well known, though it is readily admitted that the addiction habit from these drugs cannot be compared with that of morphine, heroin, or cocaine for its compelling power on the patient, nor does the withholding of the barbituric acid drugs give rise to the serious withdrawal symptoms as in the case of morphine addiction. By their modification in constitution the barbiturates not only have the narcotic action of veronal but may have a toxic action on the lungs, kidneys, liver, and heart, as has been illustrated by many recent fatalities. The danger of death from self-overdosage is too well known to need emphasis. The insomnic patient is too often suffering from psychical pain and misery, whether due to his mental illness or perhaps the depression following a too long continued use of these drugs. Can it be wondered that he takes an overdose not caring what happens, and perhaps "hoping for the worst." It is well known that these drugs cause amnesia, and if the tablets are at hand in sufficient quantity repeated doses may be taken unconsciously, and so a fatal dose be taken unknowingly. All of these considerations point to care in the prescribing of barbituric acid derivatives, and to the essential need that they should only be taken under medical supervision by prescription and not be purchased indiscriminately by the public.

In conclusion, it may be said that toxic drugs place in the hands of the medical profession very powerful weapons for beneficent therapeutic use, but their employment must be tempered with knowledge and experience of their action, and careful investigations as to their safety in prescription for any particular case.

ROYAL SOCIETY OF MEDICINE

SECTION OF SURGERY, SUBSECTION PROCTOLOGY

AT a meeting of this subsection on May 8th, Mr. ERNEST MILES, its president, being in the chair, a discussion on the

Conservative Surgery of Carcinoma of the Rectum

was opened by Prof. G. GREY TURNER. He desired, he said, to make it clear at the outset that he was not an advocate of conservative operations for malignant rectal conditions to the exclusion of other methods of treatment. He fully realised the responsibility of advocating a limited operation in the relatively few instances in which surgical aid was sought early. The subject was (to quote the words of one authority) "provocative of consideration." It might be possible in some cases, he thought, to do something between the cuff resection of Angus and the more radical procedures. For some time he had done a cuff resection, the cut being made inside the levator ani, finishing with an end-to-end anastomosis. In this operation he took away everything inside the levatores ani, including the perirectal tissues. Of 19 cases so treated one died a few weeks after operation from general deterioration following renal insufficiency, one died eight months after from general dissemination, six succumbed to actual recurrence, three died without recurrence,

and the remainder were still alive and well. After this operation convalescence was rarely a cause of anxiety. One man left the hospital three weeks after operation perfectly healed and with his rectal continence restored. By periodical inquiry he had kept in touch with his cases. In 1931 analysis showed that the sensation of the rectum was normal in 9 of 10 cases, in 9 there was adequate retention of flatus, in 1 the retention of flatus was not so good, and in that case the sphincter was divided to the anus. Most of the patients could retain their evacuations in diarrhœa as in normal times, and most of the ten possessed normal capacity for straining. In 17 cases the condition of the sphincter was assessed. It was perfect in 9, adequate in 7, and incompetent in 1, a man who had sarcoma of the rectum with early recurrence. Looking at the condition of the scar in the rectum afterwards, in seven of the cases there was little indication of any incision. The scar did not appear to interfere with the functions of the rectum. One effect of the operation was to straighten out the rectum and leave it without an ampulla. He did not cut through the bone, but disarticulated the coccyx; the operator should, he thought, not be embarrassed by an undue desire to save bone. For the anterior wall mattress sutures should be used. After completing the anastomosis he placed tissue drains into the cellular tissue, and the muscles were repaired by interrupted catgut sutures. In most cases he did not carry out a preliminary colotomy; in 4 it was done as a preliminary, in 11 it was not done, though in 2 it was needed later. Analysis of 14 cases of fæcal fistula showed that this healed in one month in 2, in three months in 10; 1 healed only after colotomy, 1 did not heal at all. For papilloma in a premalignant stage the cuff operation seemed to be admirably suited; some forms of stricture were also suitable for it. He had no use for resection over a tube.

Mr. H. H. RAYNER (Manchester) described the conservative operation for growth in the upper third of the rectum, below the pelvi-rectal junction, the lower edge of which was readily accessible to simple digital examination. This operation was conservative only in the sense that the sphincteric mechanism of the anal canal was preserved for the restoration of a functioning anus. If such a procedure could be shown to offer a fair freedom from risk, with prospect of survival equal to that of the established operations, it might, he thought, be regarded as a real advance. The upper end of the rectum was a common site for growths. If it was surgically legitimate to perform a perineal excision for ordinary ampullary carcinoma, with its necessarily restricted removal of bowel and mesenteric tissues above the growth, it was, he suggested, also legitimate, when removing the rectum for high carcinoma, to preserve the musculature of the anal canal. While the risk of this operation to life was somewhat higher than that of a purely perineal operation, the risk was not greater than that of the abdomino-perineal operation. The so-called anterior resection of the rectum left the patient with an intact but functionless anal canal, and could only be justified on grounds of expediency.

The operation he was describing was introduced by Sebrecht of Bruges. It was done in two stages at the same sitting. The first was exactly like the abdominal stage of the abdomino-perineal operation, with the fundamental difference that the pelvic colon was not divided, but a suitable point was selected, usually in its lower third, for later implantation at the anal orifice. The surgeon must satisfy himself that the colon above was sufficiently long and mobile to allow of this point being brought down to the anus without undue tension, and that the blood-supply for the future anus was adequate. The mesocolon was then divided at this point from the bowel to its root, the superior hæmorrhoidal vessels being ligatured. The rectum was freed on all sides below the pelvic peritoneum, so as to facilitate the second stage of the operation. The peritoneal floor of the pelvis was then reconstructed, a gap being left in its centre through which the lower pelvic colon was passed. The edges of this gap were sutured to a point on the pelvic colon as high as possible above the area selected for the new anal orifice. The abdomen was closed without drainage, and the patient placed in a tilted lithotomy position; the lower rectum was washed out, to clear it of debris following the manipulations, and firmly packed with gauze. Next the anal orifice was closed by a purse-string suture, the ends being left long for subsequent traction.

A circular cut was then made round the anal orifice at the muco-cutaneous junction, and the mucous membrane of the anal canal dissected up as a cylinder to a height of about 2 in., special care being exercised to prevent button-holing. A cut was made backwards at the level of the anorectal ring through the muscular walls of the rectum until the subperitoneal space of the pelvic cavity was entered, thus establishing communication with the previous field of operation. The structures still holding the rectum laterally and in front were divided, and the lower rectum being freed, the bowel was drawn down through the sphincters.

Mr. Rayner said he had performed the operation for intrinsic carcinoma of the rectum on four patients. One of them, a woman aged 66, on whom he operated in unaccustomed surroundings, died as a result of the operation. The other three recovered. One man died 20 months afterwards with what the neurologist described as true progressive bulbar paralysis, there being up to death no sign of metastasis or local recurrence. Both the others (women) were still in good health three years and eight months after operation respectively. Both patients had gained in weight.

Mr. W. B. GABRIEL agreed that occasional cases of carcinoma of the rectum could be cured by local excision; the crux lay in the selection of suitable cases. After a careful review of cases at St. Mark's Hospital, he considered the only cases suitable for conservative resection in the manner carried out by Prof. Grey Turner were those which came into the "A" group of Dr. Cuthbert Duke's classification. Of 142 cases submitted to operation only 16 (11 per cent.) were considered suitable for local treatment. Of a large number of rectal cancer cases only some 5 per cent. fell into group "A." Conservative resection should be reserved for cases in which colostomy was refused or there was some difficulty in the patient's mental or economic position. Cancers were frequently double, polypi had a cancerous tendency; by a more thorough operation the surgeon knew he was reducing the risk of another cancer forming in vulnerable tissue. By the conservative method it was technically difficult to mobilise the entire rectum, especially the anterior wall, and bring it down to make a good anastomosis. A third reason against it was the difficulty in assessing the depth of the spread.

Sir CHARLES GORDON-WATSON said he rarely encountered cases at such an early stage that conservative or local operation could be reasonably considered. It must never be forgotten that one was dealing with a potentially malignant rectum; the local operation meant removing only part of the malignant area.

Mr. J. P. LOCKHART-MUMMERY suggested that the history of proctology ran in circles. The operation

now described by Prof. Grey Turner was done 25 years ago, but with improvements in technique, preparation, and anæsthesia results might now be better. He had used the local operation for stricture and for adenoma. In recent years he had not returned to it for carcinoma as there was a 40 per cent. risk of recurrence. In the operation described by Mr. Rayner the piece of bowel brought down was liable to slough, however carefully the operator might think he had preserved the blood-supply.

Mr. CYRIL NORBURY related a case in a girl, aged 18, of villous papilloma, probably premalignant, on whom he did a cuff resection with end-to-end anastomosis, but without preliminary colostomy. Later he had to do a perineal excision of the rectum.

Dr. CUTHBERT DUKES said there were two schools of thought among surgeons each of which sought the views of pathologists in their support. He would suggest two useful generalisations. Cancer of the rectum remained a local disease until it spread by direct continuity into the perirectal tissues, and there was a fairly long period before this spread occurred. When a surgeon tried to estimate how far a growth had spread by direct continuity, he was apt to under-estimate that spread, as shown by subsequent microscopy.

Mr. W. TURNER WARWICK described a method by which, when doing local resection, the sphincter could be preserved.

In reply, Prof. GREY TURNER said that the number of cases suitable for the conservative operation was likely always to be a small proportion, perhaps not more than 3 per cent. With greater facilities for examination and improved technique he hoped it could be increased.

Mr. RAYNER agreed with the view that recent advances led to better results from less drastic procedures. His own results from the operation he had described for high rectal carcinoma had been so good that he intended to continue.

REVIEWS AND NOTICES OF BOOKS

Problems of Anæsthesia in General Practice

By D. H. LUKIS, M.D. London: Hodder and Stoughton. 1935. Pp. 158. 7*s.* 6*d.*

THIS is a thoroughly sensible little book which, in essay form, was awarded the Sir Charles Hastings prize of the British Medical Association. Almost every page gives evidence of the sound judgment of the writer, and every doctor whose duties include an occasional administration of an anæsthetic should read it. Dr. Lukis ignores no difficulty with which the general practitioner may have to cope when he is required to give an anæsthetic, and points unerringly to the best way out of every dilemma which she describes. Moreover, she defines clearly the circumstances in which the giving of an anæsthetic should be left to an expert. Having defined the characteristics of an ideal anæsthetic and some of the special difficulties of general practice, she proceeds to discuss the estimation of anæsthetic risks, the choice of anæsthetic, and the problems presented in special operations, in preparation of patients and of administration, improvisations and substitutes, and post-anæsthetic conditions.

The sections in the book which deal with the urgent and trying behaviour of patients under anæsthesia could be read with profit by specialists, but for the most part it is with the problems of the occasional anæsthetist that she is concerned. The specialist nowadays has to be more or less familiar with all methods and is little hampered by questions of expense and portability; the practitioner's position in these respects is far otherwise. He is shown here how to use to best advantage the apparatus and the skill that are likely to be in his possession. Dr. Lukis gives a list of what he should carry; this does not include nitrous oxide, but he must be prepared to use this gas where it is provided, whenever the case is deemed suitable. Magill's nasal tubes are part of the routine outfit suggested, and Dr. Lukis strongly recommends the practitioner to familiarise himself with their use. Generally speaking, in common with most of her colleagues, she has found that induction by CE mixture followed by open ether is the most valuable routine method. She is fully alive to all the latest introductions in anæsthetic administration, and shows logically where they fail to earn the reliance of the general practitioner anæsthetist. She gives reasons for her view that avertin is essentially a specialist's anæsthetic; evipan, however, she regards as a valuable agent in many situations in which the practitioner may find himself.

The author's sympathetic regard for the patient's point of view is manifested by her analysis of the nature of pre-anæsthetic fears in 400 consecutive patients; of these the fear of (*a*) never waking up, (*b*) choking or suffocation, and (*c*) feeling pain are the most common, each accounting for some 20 per cent. of the cases. The fear of (*d*) the theatre, surgeon, and of instruments is, in Dr. Lukis's view, somewhat exaggerated by advocates of rectal and intravenous anæsthesia; in her series some 12 per cent. experienced—or confessed—to it. Of the rest, 9 per cent. had a horror of (*e*) making fools of themselves, 7 per cent. disliked (*f*) the idea of losing consciousness, 6 per cent. dreaded (*g*) post-anæsthetic complications, and 1 per cent. (*h*) admitted no fear. The author notes that three of the four patients in this last group showed a definitely exaggerated excitement stage, indicating that their fears were probably repressed rather than absent. These figures are given merely to illustrate the fact that one patient's ideal anæsthetic may be another's bête noir, and other things being equal Dr. Lukis would give local anæsthesia to groups (*a*) and (*f*) and make a special effort to avoid it in group (*c*); non-inhalational anæsthesia or premedication is called for in group (*b*) and contra-indicated in group (*e*). Dr. Lukis, in common with many anæsthetists, clings to status lymphaticus as an entity and does less than justice to the pathologists whose denial of its existence follows logically on the demonstration of the remarkable variations in size of the thymus gland in normal subjects.

The book is written in a crisp and pleasant style with apposite case-notes. The practitioner's point of view is always remembered. He is urged to make certain, before attempting to give an anæsthetic, that he has the confidence of the three important persons concerned—the patient, the surgeon, and himself. If the first and the last are satisfied of his competence, the surgeon remains for consideration. Dr. Lukis's attitude to this delicate problem in professional relations may best be given in her own brisk words, addressed to the anæsthetist—"the surgeon has a hard and exacting job and it is not fair to add any additional burden. Your duty to

him is to provide him with a specialist anæsthetist if he shows signs of wanting one. Should he do it too often, examine your anæsthetic technique, and, if it satisfies you, change your surgeon."

The Single Woman

By ROBERT LATOU DICKINSON, M.D., and LAURA BEAM. London: Williams and Norgate Ltd., and Baillière, Tindall and Cox. 1934. Pp. 469. 21*s*.

THIS book is based on a study of 1078 case records of single women who were treated as patients by Dr. Dickinson. The authors regard it as a continuation of an earlier work, a study of a thousand marriages (see THE LANCET, 1932, ii., 523), and desire that it should be read in conjunction with the topographical atlas of human anatomy noticed in our columns on April 20th last. The book now under review has much the same merits and defects as the study of married women. Dr. Dickinson is a close and accurate observer, whose artistic gifts are now almost as well known to the medical public of this country as to Americans. His most valuable and distinctive contribution to medicine is the correlation which he discerns between the sex life of the woman and her genitalia. In his words, "the female organs of generation, especially the external, largely document the sex life." The relation is stressed in the numerous and interesting case-histories contained in this book, and in the drawings of the topographical atlas.

The average age of the women in the present series is 26, their educational opportunities rather above the average, their health rather below. Venereal disease and pregnancy occurred three and four times respectively in every hundred women. The length of time during which they were observed averaged a year—considerably less than in the series of married women. One in five patients had practised what the author calls "auto-erotism," and there were 28 recorded cases of homosexuality of whom all but 2 ended with heterosexual experiences. An interesting feature of the book is Dr. Dickinson's analysis of the changes in social outlook, dress, and sexual habit which have taken place since the year 1893. The articles of apparel customarily worn by women in that year are shown in a diagram. Five bands were worn round the waist, and it is estimated that all the layers fastened end to end would make a bandage 34 ft. long, the circumference of the waist being taken as 24 in.

Even more apparent than in previous books are the defects of Dr. Dickinson's literary style. These fortunately do not affect his case-histories which read easily and pleasantly; they particularly relate to his summaries, deductions, and conclusions. It is no exaggeration to say that some of these are unintelligible. An interesting chapter on virginity begins with the statement "The bystander becomes virgin again when he lights a candle before the Virgin's shrine." What does this mean? In a chapter on the engagement occurs the following passage: "A professional woman 27 years old is a state of mind. Three or four years' preparation for self-support accepts a discipline which presents other than instinctive values. Choice of a profession is a choice against marriage in so far as it removes uniqueness and places marriage among alternatives." Dr. Dickinson would perform a very welcome service to his many loyal readers if he would write grammatically, observe the elementary rules of punctuation, and refrain from stating his conclusions in poetic or mystical language.

The findings of this series must not be taken as typical of the average unmarried woman, for they are based upon selected material. The women here considered became subjects for investigation by reason of their having attended a gynæcologist for treatment of some dilemma in his province. Nevertheless, the study has much general as well as medical interest.

The Vitamin B Requirement of Man

By GEORGE R. COWGILL, Ph.D., Associate Professor of Physiological Chemistry in Yale University. Published for the Institute of Human Relations by Yale University Press. London: Humphrey Milford, Oxford University Press. 1934. Pp. 261. 18*s*.

IN 1923 Prof. Cowgill conceived the idea of seeking to ascertain how the vitamin B (B_1) requirements of man and some of the lower animals differed, and whether any discoverable general principle underlay the mode of their differing. This book gives an account of his researches in the ensuing years and of the conclusions which he reached. A single preparation of dried yeast was used throughout as source of the antineuritic vitamin B_1, and in terms of this, the quantitative requirements of the dog, rat, mouse, and pigeon were ascertained. From these results a general formula was established, relating the vitamin requirement to the body-weight and metabolism of the species. Attempts are made to ascertain whether this formula would hold good for the human species. For this purpose, the vitamin B_1 values of a great number of foodstuffs are collected from various sources into a Table (Table 21), where they are expressed in terms of the author's special preparation of dried yeast. These values are then applied to the estimation of the vitamin B_1 values of human diets on which beri-beri is known to have, or not to have, occurred. As a result, the incidence of beri-beri on these diets is shown to be not just inversely proportional to the vitamin B_1 intake, but to be influenced, in addition, by the relative calorie intake and body-weight, in accordance with the author's formula. In short, the formula works when it is practically applied, in that it harmonises data which are otherwise somewhat conflicting. On page 105 the author gives a factor by which the vitamin B_1 value of foodstuffs, expressed in terms of his yeast preparation, can be converted into international units; this makes the values for the various foodstuffs, collected in Table 21 much more universally useful. A bibliography and good table of contents is supplied but no subject index.

Methodik der Vitaminforschung

By CHRISTIAN BOMSKOV, Ph.D., Chemiker an der Universitätskinderklinik, Kiel. Leipzig: Georg Thieme. 1935. Pp. 301. RM.24.

Dr. Bomskov's book is an encyclopædic work on the biological, physical, and chemical methods of estimating vitamins. It contains a vast amount of useful material but this is not critically handled, so that the reader, though practically certain to find the details of any method he is seeking, does not receive much guidance in selecting a method if his mind is not already made up. The international standard preparations and units are mentioned, but might well have received more attention. The indispensable necessity of making a *simultaneous* test with the standard, in every biological vitamin assay which makes any claim to accuracy does not seem to be fully appreciated by the author. An index and a very full table of contents make it easy to find any reference required.

THE LANCET

LONDON: SATURDAY, MAY 18, 1935

THE MEDICAL CURRICULUM

SOME four years ago the Board of the Faculty of Medicine of the University of London had under consideration a number of requests from various sources for modifications in the medical curriculum. This circumstance brought to a head the feeling in all medical faculties and institutions that the existing course of medical study required modification chiefly in the direction of making the work of the student less complicated while ensuring continuity in study—a welding both of what had been learnt with what was being learnt and of laboratory training with pathological study. The London faculty, aware of the dissatisfaction existent in other universities, and already officially expressed at Cambridge by certain changes in the educational curriculum, invited that University, the University of Oxford, and the English Royal Colleges to a conference "to consider the defects of the medical curriculum and to make suggestions for reform." The invitations having been accepted, a representative membership was constituted, one of whose first actions was to invite the coöperation of the Society of Apothecaries of London. The Medical Curriculum Conference elected Lord DAWSON OF PENN chairman; the members of the conference were named on their appointment in THE LANCET (1932, ii., 1283), and were recognised as an authoritative body. They got to work about two years ago, and the report which is issued this week shows how industriously they have discharged their difficult task.

The conference recognise that the object of the medical curriculum in general should be to give the student of average ability such knowledge and such education as will enable him to approach and enter practice with some confidence and with a legitimate hope that "his scientific outlook on health and disease should enable him to learn from subsequent observations and experience." The idea that the newly qualified man has completed his medical education being thus pleasantly contradicted, it was held that the curriculum should be designed to make him a safe adviser, though State registration as a doctor cannot transform him into an accomplished therapeutist. The multiplicity of special courses of instruction followed by examinations are found to interfere with just that sequence in study which is desired, while the memorising of details in connexion with special branches occupies time which could better be employed by the student along wider lines. Reform in these directions forms the subject of the main recommendations, and how they can be carried into effect is indicated by the body of the report, in which the time occupied in premedical studies, the intermediate studies, and the actual clinical work is considered in detail. Recognising that the general education of the intending medical student is of the first importance in the framing of a curriculum, the conference took evidence from the obvious sources, and it was to the effect that the education of the advanced schoolboy need not be neglected during preparation for preliminary science examinations; but they came to the conclusion that, in order to allow sufficient time for general education and to avoid the danger of too early specialisation, medical studies proper should not be begun before the age of eighteen. On the difficult subject of the intermediate studies the report is admirable. While not recommending that any change should be made in the present arrangement, whereby the first two years of the medical curriculum are devoted to the study of anatomy and physiology, they suggest methods of rearrangement, relying on concerted action among the teachers, so as to construct a course which should be "more harmonious, consecutive, and interesting." They consider that the work of the student during the intermediate period should be arranged by a board of teachers representing anatomy, physiology, chemistry, biochemistry, pharmacology and pathology, and they indicate how modifications could be introduced, which are summarised in the final recommendations. The activities of such a board, intent on demonstrating to students the close inter-relation of the separate facts to be mastered and the large amount of common ground to be worked over, should be fundamentally valuable.

Two *brief statements* will be received by students and teachers alike with gratitude. The conference hold that in the past too much time has been spent and too great a stress has been laid on memorisation of the structure and details in anatomy for examination purposes; and of physiology it is stated that while coöperation with the clinical staff of the teaching hospital to which the school is attached may prove essential, the student at this stage should not be receiving actual instruction in medicine but rather learning how his physiological equipment ought to be interpreted in terms of therapeutics. The heads of physiology departments, the conference suggest, should have access to patients and be able to enlist the services of members of the clinical staff to give appropriate demonstrations; but the student at such demonstrations should be shown patients not as examples of disease, however typical, but as examples of deranged function. These words face the difficulties inherent in prescribing a curriculum, in which duly proportional opportunities should be given to the acquirement of facts and to the employment of the lessons learned. For such joint demonstrations would introduce the student to that all-important side of his future calling, the consideration of the patient as a fellow creature rather than as a case. That the student is himself alive to this aspect of

his training is evident from a discussion on a later page of this issue. The report is a wise one and its presentation excellent.

ÆTIOLOGY OF ACUTE RHEUMATISM

DURING the past thirty years there have been many attempts to discover the causal agent of acute rheumatism. The great majority of these have ended in incriminating the streptococcus. No one would deny that the streptococcus is in some way concerned with the pathogenesis of this disease; the constancy with which streptococcal tonsillitis or pharyngitis precedes acute rheumatism is sufficient evidence of this. But there are grounds for doubting that the streptococcus is the prime cause. First of all there is the fact that all three main types of streptococci have in turn found favour as ætiological agent. The "micrococcus rheumaticus" of POYNTON and PAINE was in all probability *S. viridans;* BIRKHAUGH favoured the non-hæmolytic streptococcus; and the last few years has seen *S. hæmolyticus* given pride of place. And then there is the histological evidence that tells us that the tissues of man react to the "virus" of acute rheumatism in a quite specific manner, giving a type of lesion not found in other streptococcal infections and not capable of reproduction in the tissues of other animals by the various "rheumatic" streptococci. All this makes it questionable whether the streptococcus is the whole story, and in our last issue Drs. SCHLESINGER, SIGNY, and PAYNE, of Great Ormond-street Hospital, who have hitherto been at one with COBURN in considering the hæmolytic streptococcus as the prime cause of acute rheumatism, give other reasons for thinking this view unsatisfactory.

The idea that acute rheumatism is a virus disease is not a new one, and unsuccessful attempts have been made to demonstrate this theory of its origin. Very suggestive evidence in its favour, however, is brought forward this week by SCHLESINGER and SIGNY, now collaborating with Dr. RUSSELL AMIES of the Lister Institute. The means whereby the viruses of psittacosis and vaccinia were identified with the minute bodies seen in stained preparations of virulent material have been adapted to the present investigation, and pericardial and pleural fluids from cases of acute rheumatism have been submitted to fractional and high-speed centrifugation in an endeavour to find out whether these exudates contained demonstrable virus particles. Pericardial fluid from 7 cases was examined in this way and in the deposit obtained from 6 of them particles were seen which, from their uniformity in size and from their appearance in stained preparations and when viewed by dark-ground illumination, were thought to be virus particles. The 6 fluids which gave this positive finding were all from acute cases in the second or third week of the disease; the remaining sample in which no such bodies were found came from a chronic case of some months' standing. Mr. J. E. BARNARD has examined these bodies by the special methods which he has devised and applied so fruitfully in the study of other viruses; and although he hesitates to state definitely that the particles represent a virus he thinks that in all probability they do. But SCHLESINGER and his colleagues have carried the investigation a stage further: for they have also shown that formolised suspensions of the bodies obtained from the pericardial fluid are agglutinated specifically by the sera of patients suffering from acute rheumatism. This part of the work has been carried out by Dr. AMIES, whose investigation of the viruses of variola-vaccinia, zoster, and varicella has made him thoroughly familiar with the difficulties and pitfalls of such inquiries. The experiments have been fully controlled and the agglutination of these bodies appears to be specific.

Does this mean that the virus ætiology of acute rheumatism is established? The investigators are careful to point out that they regard their findings as no more than suggestive. A good deal more requires to be done and in particular renewed attempts to reproduce the disease in experimental animals will have to be undertaken. But supposing that acute rheumatism were known definitely to be due to a virus, would one be in a better position to combat it? That is no easy question to answer. If the causal agent of rheumatism is a virus, then obviously it is one of those, like herpes, which, when it invades the tissues of man, does not incite a solid immunity but leads to what one might term a state of armed neutrality. This delicately adjusted balance of power between host and invader is readily upset by such factors as intercurrent infection, with unfortunate results for the host. Whether or not in virus infections of this type one can by specific means weight this balance more definitely in the host's favour is as yet uncertain. To attempt to predict the possibility of achieving this in acute rheumatism would merely land us in the realm of conjecture.

THE DURATION OF LIFE

THE Registrar-General and those who quote him are not the only students of the duration of life and the causes of death. The experimental biologist collects statistics from controlled communities—"cohorts" is the technical term—of flies, slugs, fish, and such creatures, and asks the question "why do they die?" A recent paper[1] from RAYMOND PEARL'S laboratory illustrates one method of treating these statistics. The survival-rates per 1000 initial members of a cohort are plotted against time and different species are found to yield different curves. In the first type nearly all the individuals survive to a certain age and then die off within a short time; either they all run down together like a batch of similar clocks, or they all explode together like a batch of bombs with time-fuses, or they are all destroyed together by an outside agency. Such a curve is found for the wheel-animalcule proales, which would appear to be constitutionally either a clock or a bomb, and it can be obtained from a cohort of flies if they are subjected to starvation—an outside agency. In another type of curve a steady mortality-rate reduces the cohort

[1] Pearl, R., and Miner, J. R.: Quart. Rev. of Biol., 1935, x., 60.

progressively from youth to old age, until a mere handful remain; the age of the individual per se has nothing to do with the probability of its dying. From that it is argued that the predominating cause of death is not constitutional, but environmental and accidental; so many individuals per centum are destroyed every day by what the authors call "major catastrophic environmental stoppages of the individual life." An approximation to this type of curve is found in certain aquatic organisms (hydra), which also have the characteristic of continuous growth; they never grow old, they just grow bigger till they are accidentally killed. A third group of curves is intermediate between those two types, and includes the mouse, the roach, and wild drosophila. The human curve, which is less simple than those studied in laboratories, probably belongs here too.

From these curves, and kindred data, an attempt is made to deduce the factors determining the occurrence of natural death, and its distribution in time (age). Five of them emerge: (1) endogenous senescence, or the running down of the clock; (2) exogenous senescence, or the accumulating effect of the wear and tear of life, the "environmental buffetings"; (3) the genetic constitution of the individual—whether he is a "Ford" or a "Rolls"; (4) the rate of living, which is taken to include all the functional activities of the organism; and (5) the risk of immediately lethal accidents. These five factors may be simplified to three—namely, genetic constitution, activity (in the broadest biological sense of the term), and environment. In other words, and applied to the human species, this means that a man may live long because he has a strong constitution and can withstand a severe environmental buffeting and a high rate of living, or alternatively because he lives a gentle sheltered life that spares his poor constitution—always provided he escapes death by accident in his youth or his prime. Such a conclusion, to the observer of mankind, would seem quite obvious and not at all new, but it is most interesting to find it emerging even imperfectly from a mathematical study of the vital statistics of slugs and flies.

ANNOTATIONS

BRITISH POSTGRADUATE MEDICAL SCHOOL

ON Monday last the King, who was accompanied by the Queen, declared open the British Postgraduate Medical School. His Majesty was received by Sir Austen Chamberlain, chairman of the governing body, and Lord Snell, chairman of the London County Council, which is coöperating actively with the Government and the University of London in the promotion of the institution.

Sir Austen Chamberlain, in asking His Majesty to approve of the efforts made by those engaged in the creation of the school and to declare the school open, stated the prolonged and laborious inquiry which had led to the practical result. Fourteen years ago, he said, a committee on post-graduate medical education, presided over by Lord Athlone, now chancellor of the University of London, reported that a school attached to a London hospital should be devoted solely to post-graduate education which would be a school for the university and should receive substantial financial assistance from the treasury. These recommendations of Lord Athlone's committee have been exactly carried out and Sir Austen described the tasks now before the school in the following words: "first, to enable medical men in general practice to bring their knowledge up to date, and to familiarise themselves with the latest developments in diagnosis and treatment; secondly, to provide instruction for graduates desiring to pursue special studies in the higher branches of the profession; thirdly, to promote research and to advance medical knowledge." He added that it was the ambition of the directors of the school to make of it a great centre of British medical science, drawing students and teachers alike from all parts of the Dominions for mutual instruction and the promotion of the relief of human suffering.

The King said, in declaring the school open:—

"It is with great pleasure that the Queen and I have come here to-day to open the British Postgraduate Medical School. The provision within the University of London of a new centre for clinical teaching marks a notable advance in the continuous effort of the medical profession to increase its capacity for service to mankind. "I am especially glad of this opportunity to show my gratitude for the skill and care which I and my family have received from members of that profession, and not least from distinguished members of the governing body of this school.

"You have reminded me that a foundation such as this was recommended by a committee presided over by Lord Athlone. A recommendation of the same committee resulted some years ago in the creation, with generous assistance from the Rockefeller Foundation, of the great London School of Hygiene and Tropical Medicine. Lord Athlone must be gratified, as Chancellor of the University, to take part in the realisation of the last stage of his far-reaching plan.

"While the two schools trace back to the same origin there is a further bond of union between them. The foundation-stone of each was laid by the Chancellor of the Exchequer, who, as Minister of Health, had so large a share in their evolution, and you, Sir Austen, following a distinguished family tradition, are chairman of each board of governors.

"It is my earnest hope that this school, with its happy union of ward and laboratory, university and local authority, drawing students and teachers alike from all parts of our Empire, and I trust from regions even more widely spread, may prosper under God's blessing. May it play an imperial rôle in the winning and dissemination of medical knowledge, in the relief of suffering among my peoples in this country and overseas, and in enabling the doctors of all lands to come together in a task where all must be allies and helpers."

Following His Majesty's declaration that the school was open, numerous presentations of members of the governing body and others directly concerned in the movement were made by Sir Austen Chamberlain. The King and Queen then made a complete tour of the building, a strenuous task as will be seen by reference to the description published in another column (vide p. 1172). Their Majesties visited the clinical lecture theatre, the library, and the various departments, where the directors were presented to them: Prof. Francis Fraser, director of the department of medicine; Prof. Grey Turner, director of the department of surgery; Prof. James Young, director of the department of obstetrics and gynæcology; and Prof. E. H. Kettle, director of the department of pathology. Each director in turn

presented his readers, while among others presented were Mr. Edwin Bax, F.R.I.B.A., the architect, Dr. Duncan White, radiologist of the hospital, Mr. Leslie Clark, Ph.D., physicist to the London County Council, and Sir Thomas Carey Evans, medical superintendent of the hospital.

PROPHYLAXIS AND EXPOSURE IN MEASLES

THAT the results of the sero-prophylaxis of measles may depend upon the conditions under which exposure to infection takes place is emphasised by some observations of Karelitz and Schick.[1] Serum was obtained from five adult immunes. The samples were not pooled but were injected individually in a dose of 6 c.cm. in two groups of susceptible children of comparable ages exposed to measles over similar periods; one group, however, consisted of children in hospital and the other of children in their own homes. It was found that the protection afforded by each sample was much greater in the institutional than in the familial group. The combined groups comprised 134 children. Comparison of the conditions of exposure showed that the protection-rates were 87 and 29 per cent.; the attenuation-rates 13 and 22 per cent.; and the failures 0 per cent. and 49 per cent. in the hospital and familial groups respectively. Similar differences have been reported in the results obtained from convalescent serum by Park and Freeman, and by Levinson and his co-workers, and these are quoted by the authors. The discrepancies in the results are diminished when larger doses of serum are employed in the case of children exposed in their homes. Thus, in further trials, 6 c.cm. of serum in an institutional group produced results closely similar to those already mentioned; but the injection of 8 c.cm. of adult serum in a familial group afforded a protection-rate of 46 per cent., an attenuation-rate of 43 per cent., the failures either to prevent or attenuate dropping to 11 per cent. Still larger doses of from 12–25 c.cm. of adult serum produced correspondingly more favourable results.

Contact in home life is more intimate than in hospital wards where exposure may be very unequal. In hospital some children may escape infection entirely; others be but slightly infected; while others again are infected intensively and repeatedly throughout the period of exposure. Karelitz and Schick observe that the differences in degrees of exposure between familial and hospital groups are accentuated in those hospitals provided with cubicles or where an isolation technique is observed. An analysis of the results obtained from the injection of 6 c.cm. of adult serum in a series of 106 children of from 2 to 6 years of age all exposed to measles for periods of from 2 to 5 days showed that in the case of children whose home conditions were good, the protection- and attenuation-rates were 58 per cent. and 23 per cent., 19 per cent. being failures. Where the home conditions were bad these rates were 0 per cent., 27 per cent., and 73 per cent. respectively, whereas in a hospital group they were practically reversed, protection being attained in 83 per cent. and attenuation in 17 per cent., there being no complete failures. An important factor in maintaining or enhancing the level of immunity to diphtheria amongst those, such as nurses in fever hospitals, who have become Schick-negative as the result of active immunisation is the frequent reception of small doses of infection which by acting as stimuli raise the antitoxic titre of the blood. Karelitz and Schick relate the results of an attempt to increase the immune antisubstances of adults by re-exposing them frequently and intimately to patients during the first few days of severe attacks of measles. Four volunteers were bled *before* and 8 and 21 days *after* the last of thirteen exposures to the disease of from 30 to 60 minutes' duration. Sera obtained before and after reinfection were injected into a large number of young children presumably effectively exposed to measles. When the group of children was considered as a whole the results appeared to be greatly in favour of the samples obtained after reinfection, but on further investigation the same discrepancy between institutional and familial exposures appeared and largely reduced the apparent superiority of the reactivated samples. By increasing the dose of the pre- and post-reactivated samples employed in the case of children exposed at home from 6 c.cm. to 8 c.cm. the advantage in favour of the reactivated samples became inappreciable.

While in institutional epidemics of measles all susceptible children may develop the disease after the first exposure, the authors remark that this occurs far more commonly as the result of successive exposures. This is, of course, quite true, and if it is a question of testing the value of any batch of convalescent or adult immune serum, which is usually pooled, doubtless the more rigorous conditions provided by familial contact are to be preferred as they suggest, but in the testing much valuable serum must be expended. In any case the medical administrator of a sick children's ward must be pragmatic; his main object is to reduce the effects of cross-infection to a minimum. To this end he will segregate the infective patient at the earliest possible moment and without relying unduly upon a past history of attack, only too often a broken reed, use his precious stock of convalescent or adult serum primarily in an attempt to prevent the expected attack amongst children under 3 years of age. If the serum which he has at hand is of attested potency so much the better. Whether the success attained should in part be credited to ineffective exposure is not of great practical importance.

[1] Karelitz, S., and Schick, B.: Jour. Amer. Med. Assoc., March 23rd, 1935, p. 991.

TUBERCULOSIS IN DOMESTIC PETS

WHILST intensive study and attention has long been focused on tuberculosis in cattle, and the importance of the bovine type of infection in causing both abdominal and meningeal lesions in children has been fully recognised, relatively little emphasis has been laid on the possibility of the disease being acquired from domestic animals. Dr. A. Hjärre and Dr. C. W. Herlitz have carried out what may therefore prove to be a fruitful piece of work [1] in investigating a number of cases of associated canine and human infection. They point out that tuberculosis is by no means rare either in cats or dogs, animals which are frequently the intimates both of children and adults. It is difficult to assess the actual incidence of the disease in domestic animals, as the majority die at home without the assistance of a death certificate. Also, the figures obtainable from the various veterinary institutions on the basis of post-mortem examinations performed show considerable differences. Thus in Berlin (1925) the percentage of tuberculous dogs was 0·3, of tuberculous cats 2·0, while the corresponding figures for France (1927) were 5·6 (dogs) and 13·5 (cats). Dogs under two years of age are, however, more frequently found

[1] Acta pædiat., 1935, xvii., Supp. I., p. 141.

affected than older animals, and the disease is rare in dogs over seven years old. Tuberculosis is commoner in male than in female dogs; sheep dogs, fox-terriers, and airedales appear to be the most susceptible breeds. Hjärre and Herlitz report in detail six cases in which the occurrence of tuberculosis in a human being and in a dog or cat living in the same household suggests more than a coincidental relationship. Notes on two of the cases follow.

A poodle had lived for seven years in the house of a healthy mistress and had been well throughout this time. From the spring to the autumn of 1932 a woman lived in the household; in May, 1932, she began to cough, and in the following February, 1933, she died with extensive cavitation of the lung and tubercle bacilli in the sputum. She had been very intimate with the poodle, whom she was in the habit of feeding from her own plate. In October, 1932, the dog began to cough, and in November was diagnosed at the veterinary college as suffering from active pulmonary tuberculosis. The diagnosis was confirmed at post-mortem examination in March, 1933.

In January, 1932, a dog who had lived in a household for some years began to cough, lose weight, and become anæmic. A diagnosis of pulmonary tuberculosis was made and confirmed at autopsy when the dog died in May, 1932. Tubercle bacilli in the tracheal secretion were of human type. A month after the dog's death a girl of 14 in the house became affected with erythema nodosum. In this family, however, the mother had suffered from pleurisy in 1930, but had been free from cough and all symptoms since this time.

In three of the cases of animal infection in which the organism was isolated, it was found to be of human type. Whilst it is possible that the tubercle bacillus may become non-virulent to human beings by passage through a dog or cat, the Scandinavian investigations more than suggest the possibility of infection of animals from a human source, and make a case for considering the possibility of human infection from domestic animals. Coöperation of doctors with local veterinary institutions would be valuable.

WORK AND NOISE

INTERFERENCE by noise with the capacity to hear produces a disproportionate mental irritation. Hence a tendency exists a priori to ascribe a maleficent influence to noise—which may be defined as an excess of unwanted sound. When efforts were undertaken by the Industrial Health Research Board [1] to measure this influence, they disclosed that it may readily be exaggerated, if estimated by its effect upon industrial work. Like any other unvarying stimulus, noise produces progressively diminishing effects with continued application; hence discontinuous noise is more disturbing than continuous. Noisy conditions may even become a kind of natural background to work, and a change from noise to silence may disturb performance more than minor changes in the noisy background. Further studies [2] have recently been conducted in weaving sheds where the continuous roar and clatter of power-driven looms constitutes a very definite excess of unwanted sound, amounting to 96 decibels which is a sound intensity entitling it to the term "blare"—corresponding to the term "glare" used in connexion with excessively bright lights. So great is the racket that weavers practise lip-reading in order "to hear themselves speak." Moderate traffic noise, for comparison, has a sound intensity of about 60 decibels, ordinary conversation of about 50. The noise was somewhat deadened experimentally by the use of ear defenders, or plugs placed in the ears, which lessened the sound intensity by 15 decibels—about half the apparent loudness. The new study was spread over a period of 12 months during which accurate records of output were carefully compiled. It strengthens the conclusion previously advanced that excessive noise is by no means a negligible factor in determining industrial efficiency; the performance of normal daily work is definitely handicapped thereby. While weavers may become so accustomed or acclimatised to noise that consciousness of its subjective effects—irritation, annoyance, distraction—ceases or becomes much less acute, yet their personal efficiency was found to be increased by about 7½ per cent. when the noise was subdued by wearing ear defenders. This is an effect of considerable magnitude; moreover, it is not a temporary one, occurring only in the initial stages of exposure to noise; it occurs in individuals who for years have been accustomed to excessive noise at their work. Complete immunity cannot be acquired, unless it be by the development of partial deafness—a cure more troublesome than the trouble. This study proves that it is worth while in the interests of comfort and of production to reduce noise in industry by every possible means, whether by quietening machinery or by palliatives such as ear defenders.

[1] Two Studies in the Psychological Effects of Noise. Industrial Health Research Board. Report No. 65. H.M. Stationery Office. 1932.
[2] The Performance of Weavers under Varying Conditions of Noise. Ibid. Report No. 70. 1935.

WILHELM KOLLE

THE death on Sunday last of Prof. Wilhelm Kolle, director of the Institute for Experimental Therapy in Frankfurt, removes Germany's outstanding bacteriologist. Kolle was born in the Harz, qualified in 1892, and then for four years assisted Robert Koch at the Institute for Infectious Diseases in Berlin. As an outcome of his position there he was asked by the Cape Government to conduct a scientific expedition in South Africa and by the Egyptian Government to do the same in the Sudan, where he founded a laboratory in Khartum. Thus early he gained the world-wide knowledge of the problems of infectious disease which enabled him to collaborate with Wassermann in the classical Handbook of Pathogenic Micro-organisms which now runs to ten volumes. On leprosy, rinderpest, cholera, and plague Kolle made important individual contributions; he was the first to prepare an effective antiserum to an ultramicroscopic virus (rinderpest), and the simultaneous method of immunisation was due to himself and the late Sir George Turner, formerly M.D.H. for the Transvaal. It was Kolle also who in association with R. Otto evolved the method of immunisation against plague with attenuated cultures, and who with R. Pfeiffer worked out protection against cholera with dead cultures. As Ehrlich's successor at Frankfurt he became director of the Georg Speyerhaus research establishment, and it was he who first produced neosalvarsan. He also worked at a forerunner of stovarsol which Ehrlich had described as "spirocid" and discarded on account of its toxicity. More recent books in which Kolle participated are evidences of his ever restless literary

activity: a handbook of Salvarsan Therapy, a textbook of Clinical Methods of Investigation, and one on Experimental Bacteriology. For a short time he occupied the chair of bacteriology at Berne, but he was not at home outside his Fatherland, and the rest of his life was spent in German University towns.

A CENTURY OF MEDICINE IN BENGAL

WE published last week an account by a correspondent of the centenary of Bengal Medical College. In the early days of the British occupation of India the practice of medicine was speculative and empirical, the excellent Arabic and Hindu systems, which had been employed for hundreds of years, having fallen from their high estate. Native medical men were bound by tradition, and the only dissection possible was that performed on animals and at post-mortem examinations. A new era dawned when a government order abolished the Native Medical Institution and, in February, 1835, founded a new college in the converted petty-court jail, to which Assistant-Surgeon M. J. Bramley was appointed superintendent. The breaking of the racial prejudice against dissection was due to Pundit Gupta who, with four courageous pupils, went secretly to an outhouse and with his own hands dissected a body under the direction of Dr. Goodeve, assistant to Dr. Bramley. The first college examination was held, after 3½ years of study, in October, 1838, the curriculum embracing eight medical and allied subjects; midwifery was excepted, for the teaching of which there was no provision. In 1845 the college was recognised as a teaching centre by the Royal College of Surgeons of England, and in the same year Dr. Goodeve sailed with four Indian students destined for higher studies in England, where they proved highly successful. The foundation-stone of the medical college hospital was laid by the Earl of Dalhousie in 1848, the Government making a grant of £50,000 from the lottery fund, a means of raising money which had been suppressed by English public opinion some years before. Marble tablets on the walls of the staircase set out both the Vedic and Hippocratic oaths. Familiar names stand out in this history. Esdaile began to operate in 1845 upon patients under the influence of mesmerism, and published a book in the following year giving his experience of 261 operations. Partridge introduced the bloodless method for scrotal elephantiasis, while O'Brien opened the sac in treating hernia and began the excision method for hydrocele. McLeod journeyed to Edinburgh to see Lister's work, and on his return to India did 13 amputations without a death. The emergencies of the Mutiny led to the employment of female nurses who wore no uniform but carried a fan as a badge of office. There are many other interesting recollections in the centenary volume.

CONGENITAL WORD-BLINDNESS AND READING DISABILITY

CHILDREN who find difficulty in learning to read are often brought to child guidance clinics for analysis and treatment and it becomes a matter of importance to discover the physical and psychological factors in the case. S. T. Orton, whose writings on this subject are well known, groups together cases in which others have found differentiating features. An article by Miss K. Duguid in *Guy's Hospital Reports* for January is of value in emphasising these differentiating features and supplying a basis for diagnosis and treatment. Miss Duguid, who is psychometric assistant at the hospital, distinguishes three definite types of reading disability. First congenital word-blindness, as described by Hinshelwood, characterised by the gravity of the symptoms and the inability to interpret words although perception may be perfect. Secondly, visual imperception or malperception, in which there is confusion of letters of similar form and even reversals of small words—e.g., "was" for "saw." Thirdly, the condition of left-eyedness and ocular dominance, on which Orton lays so much emphasis, with a tendency to mirror writing and to reading from right to left. The first group can usually be clearly diagnosed, but the second and third have some features in common. Miss Duguid differentiates a fourth group of reading disability, less specific in type, due probably to a combination of causes, including subnormal intelligence, poor auditory perception, and emotional disturbances. Classification so stated appears simple, but a careful reading of the illustrative cases quoted by Miss Duguid and described in considerable detail demonstrates the extreme complexity presented by diagnosis and the possibility of many factors being responsible for the symptoms of a particular case. That heredity was playing a part is clear in some of the cases, but on the whole environmental factors predominate. The article illustrates the value of one kind of investigation now being carried out by child guidance clinics on behaviour problems. Treatment, Miss Duguid points out, has to vary "in accordance with the particular difficulties, interests, and capacities of the individual"; no one method can be applied all round. It is only by more and more individual study of these children that a clearer understanding of their difficulties can be reached.

A MEDICAL HISTORIAN

THE recent death of the distinguished medical historian Fielding Hudson Garrison reminds us that he, perhaps more than any one man, contributed to the rising of a valuable school of medical biography in the United States, the example there set having been followed in all lands. Garrison, who was 64 years of age at the time of his death, interpreted the responsibility of a medical historian in a large way, sometimes by writing individual memoirs, and at others by furnishing accounts of medical progress along different lines, illustrating the narratives by references to particular protagonists. He was thoroughly equipped for the task, as for 33 years, 1899–1922, he was assistant librarian at the Army Medical Library in Washington. During a large part of that period he was co-editor of the Index Medicus, published from the Surgeon General's Library, and editor of the Index from 1912 to 1927, when the publication was affiliated with the Quarterly Cumulative Index of the American Medical Association. Among his best known literary productions is his "Outline of Medical History," which appeared first in 1913, went through more than one edition, and was brought to the notice of the English public by his friend Clifford Allbutt, who always had a high admiration for Garrison's talent. Among the biographies from Garrison's pen may be mentioned in particular a memoir of J. S. Billings, while his more general reviews of the march of medicine include "A History of Endocrine Doctrine" which appeared in 1921, "A History of Pædiatrics" which appeared in the following year, and finally "A History of Military Medicine"; here active service had given him personal knowledge, for he had served in the Philippines with the American Army, and in various training camps in the United States during the late war. Garrison's editing of the Index Medicus

proved him to be a prodigious as well as methodical worker, but he found time apart from his official labours to be deeply interested in the arts, and was especially a lover of music. He is a great loss to medical literature.

RUPTURE OF THE RENAL PELVIS

Dr. Benjamin S. Abeshouse has found [1] records of 64 cases of rupture of the pelvis of the kidney and adds 3 from his own clinic. In reviewing the findings, he begins by dividing rupture of the kidney into traumatic and spontaneous. The first may occur either with a congenitally normal kidney or with one severely damaged by inflammation or obstruction. It is usually the result of direct or indirect trauma exerted against the kidney in such a way that the pelvis is jammed against the lower ribs or the transverse processes of the upper lumbar vertebræ. When this happens, the tear is usually linear and radial. Spontaneous rupture, on the other hand, never takes place unless the kidney is already the seat of a chronic pyelonephritic or hydronephrotic process. Rupture here is due to a sudden or gradual alteration in the intrapelvic pressure caused by the addition of an obstructive lesion in the upper or lower urinary tract. Rupture of a pathologically weakened pelvis has also been known to follow instrumentation—e.g., retrograde pyelography. Traumatic rupture is commoner than spontaneous, and as would be expected is seen more frequently in males than females. It is to be suspected if, in a patient with an antecedent history of chronic pyelonephritis or hydronephrosis, there is a sudden sharp pain in the renal region followed by swelling, rigors, pyrexia, vomiting, and (often) collapse. A clinical impression of rupture should always be confirmed by pyelography by the gravity method. Operative treatment may be conservative or radical, but nephrectomy is unjustifiable until the condition of the other kidney has been ascertained. In a patient with much toxæmia or debility the operation should be carried out in two stages, preliminary drainage being followed by nephrectomy or conservative repair at a later date.

ACUTE OPHTHALMIA IN EGYPT

IN the eighth annual report [2] of the Giza Memorial Ophthalmic Laboratory, the director, Dr. Rowland P. Wilson, has some interesting remarks to make about the seasonal ophthalmias in Egypt. It appears that the two common forms of acute ophthalmia—namely, Koch-Weeks conjunctivitis and gonococcal conjunctivitis, which he finds from smears to be of about equal frequency—differ materially in the time of their appearance. The former occurs in epidemic form chiefly in the spring, the latter in the autumn, as is well brought out in the graphs which accompany the report. It is easy to explain the coincidence of the Koch-Weeks infection with the onset of the warmer days in the spring, but why is not the increase continuous through the still hotter days of summer? Dr. Wilson finds three grounds for this: (1) excessive heat inhibits the growth of the Koch-Weeks bacillus; (2) its virulence falls after it has reached epidemic character in May and June; (3) the drop in July and August is associated with the decrease in the number of flies. The primary and secondary seasonal maxima of cases coincide with the two definite fly-breeding seasons of the year. The incidence curve of gonococcal conjunctivitis on the other hand depends on two purely climatic factors, temperature and atmospheric humidity. The gonococcus is peculiarly susceptible to desiccation and survives in discharges only so long as these remain moist. In pus it dies as soon as the pus dries. The Koch-Weeks bacillus may be still alive two and a half hours after drying in the open and can withstand drying at room temperatures for at least 18 hours. This explains why gonococcal conjunctivitis is comparatively rare during the dry hot spring, but begins at once to increase when the atmosphere becomes moister. No doubt methods of transmission also play their part in the difference. Direct Koch-Weeks infection by flies has not yet, it seems, been subjected to direct proof, but is now being investigated in the Giza laboratory. Dust is another fruitful source of chronic conjunctivitis and may have some effect in increasing acute cases of the Koch-Weeks variety. The dry desert winds of March and April, while favouring the spread of this form, would inhibit the spread of the gonococcal variety. In Egypt the coincidence of gonococcal urethritis and conjunctival infection is held to be unusual. Urethritis shows no sign of seasonal variation in the figures collected from all the Government venereal centres in Cairo. But does this in itself prove that the two are not related? Ophthalmia neonatorum, as we know it, is uncommon in Egypt.

[1] Surg., Gyn., and Obst., March, 1935, p. 710.
[2] Cairo: Schindler's Press. 1934. P.T.25

CHARLES BELL, DISCOVERER

THERE are men of science along all lines whose original work proves so fundamentally valuable that reference must always be made to it as developments occur, and in this way their personalities, as discoverers, remain ever interesting. Charles Bell laid the foundations of our physiological knowledge of the nervous system, and in the current number of the *Edinburgh Medical Journal* Prof. Edwin Bramwell gives an interesting résumé of his life and work, the occasion being the delivery of the Harveian oration last year before the Royal College of Physicians of Edinburgh. Sir Charles Bell did for the nervous system, Prof. Bramwell claims, what Harvey did for the circulation, Harvey's work, however, being more or less finite, while Bell's opened up a new vista for his successors. Bell left Edinburgh for personal and family reasons when his work was only beginning, and came to London. He had made a mark by collaboration with his brother, John Bell the surgeon, in a system of anatomy, and had there and elsewhere displayed his fine artistic capacity. He had no regular appointment in London and for a time met with no success as a lecturer. But his sterling qualities attracted the attention of those immensely influential seniors Abernethy and Astley Cooper, and the publication of the "Anatomy of Expression" brought him immediate fame. Later he was enabled to purchase the great Windmill-street school, and was appointed surgeon to the Middlesex Hospital. There followed his discoveries in relation to the anatomy of the nervous system culminating in the publication of papers, previously communicated to the Royal Society as a volume, entitled the "Nervous System of the Human Body." This was the first exposition of the function of the nerves. In 1836, being 62 years of age, he accepted an invitation to fill the chair of surgery in Edinburgh, a position which he held until his death from angina pectoris in 1842. Prof. Bramwell's sketch shows Sir Charles Bell to have been an outstanding figure as a physiologist, pathologist, and surgeon, while his accomplishment as artist was of the greatest value to him. Prof. Bramwell shows that Bell's researches were leading him up to the dictum enunciated by Hughlings Jackson many years later that movements not muscles are represented in the cortex. And Prof. Bramwell

concludes: "Bell provided a conception of the functioning of the nervous system based upon his anatomical, experimental, and clinical observations which has been proved, by those who have followed him, to be substantially correct. He conceived what may well be described as the circulation of nervous impulses, a discovery of the first magnitude, as was Harvey's discovery of the circulation of the blood." We can never be reminded too often of the debt which medicine owes to such discoverers.

IS CODEINE A DANGEROUS DRUG?

ATTENTION has recently been directed in Canada to the considerable increase in the imports of codeine into that Dominion, and the question has been reopened whether codeine (methyl-morphine) should not be regarded as a "dangerous drug," and be subjected to the same or similar restrictions to those applicable to morphine, heroin, and cocaine. In the *Canadian Medical Association Journal* for April figures are quoted to show that, whereas in 1927 9330 oz. of codeine were imported, in 1934 no less than 46,190 oz. entered the Dominion; and further that while the per-capita consumption of codeine in Great Britain is 11 kilos per million inhabitants, in Canada it is 109 kilos. Moreover, the Department of Narcotics in Ottawa have found reason for thinking that codeine is to some extent replacing morphine among drug-addicts, more especially among the under-world in Canadian cities; it is significant that while in recent years the importations of morphine have fallen considerably those of codeine have increased. The question whether codeine should or should not be regarded and scheduled as a dangerous drug of addiction is not a new one. Indeed, at the first Hague Opium Conference in 1911–12 the question was keenly discussed and in the first draft of the Hague International Opium Convention codeine was in fact included. Its inclusion was strongly resisted by the German delegates who challenged the conference to cite any case of codeine addiction. One of the British delegates (Sir William Collins) promptly cited a case from the *Klinische Wochenschrift* of "Codeinismus," in which the victim had been reported to be taking 70 to 100 codeine pills a day, and referred to the works of Cushing and Sainsbury in support of the opinion that codeine should be regarded as a habit-forming drug. Eventually codeine was struck out of the Convention to secure unanimity, but, as was remarked by the British delegate, "it must not be held that this is done because codeinism and codeine mania are unknown to medical literature." At the present time, under an order in council and by special regulations which came into force on Jan. 1st, 1934, codeine and its salts become drugs under Part III. of the Dangerous Drugs Acts for certain purposes, but are not subject to the regulations which apply to other drugs named in Part III. We understand that the Narcotics Division at Ottawa have placed the information collected in Canada before the Opium Advisory Committee of the League of Nations and that the Health Committee of the League has been requested to report as to whether codeine should or should not be dealt with like other dangerous drugs of addiction.

LATE RESULTS OF CHRONIC APPENDIX OPERATIONS

THE excellent new vogue of following up patients discharged from hospital many years before has recently led Dr. E. Poppe [1] to analyse the 703 patients whose appendices were removed for chronic disease in a Norwegian public hospital in the five-year period, 1928–1932. They had complained of pain in the right iliac fossa, lasting for a couple of minutes to a couple of hours, and often radiating to the right thigh. Many of them had been dyspeptic and constipated. In spite of a careful clinical examination little had been found apart from tenderness in the right iliac fossa. A noteworthy fact was the minority in which the males found themselves among the 703 patients; only 241 (34·3 per cent.) of them were males. Dr. Poppe has found a similar numerical feminine predominance in the statistics of seven other large public hospitals in Norway. In his own material the age at which his female patients were most subject to primary chronic appendicitis was between 15 and 30—an age-incidence certainly not explained by Aschoff's pathological-anatomical studies which have shown that post mortem the incidence of diseased appendices rises steadily with age both in women and in men. Another curious fact, to which Dr. Poppe draws attention, is that in his hospital acute, as distinct from chronic, appendicitis is just as common in men as in women. The appendicectomy proved fatal in three cases. A set of questions was addressed to the survivors, and those who reported themselves perfectly fit were not re-examined. As many as 646 were, however, re-examined. In 432 of these cases (66·9 per cent.) the results after the appendicectomy were good. When the patients were classified according to sex, it was found that such good results had been achieved by 84·1 per cent. of the male cases, but only by 58 per cent. of the female cases. This comparatively low percentage for women was reduced still further to 50 per cent. in the case of the women aged about 25 years. A classification, according to sex, of the ailments from which 33 men and 176 women still suffered showed that the numerically most important were constipation, dyspepsia, and nervousness combined. Nine men and 91 women came under this heading. There were as many as 41 women in whom pain in the right abdomen was the only persistent symptom. As a result of this investigation Dr. Poppe has a practical suggestion to make. The number of appendicectomies for so-called chronic appendicitis in women could be reduced if the constipation from which they suffered were properly treated; and the results of the operation when carried out could be improved if attention was paid to constipation in the after-treatment.

[1] Norsk. mag. f. laegevidensk., April, 1935, p. 395.

THE King has nominated Dr. John Ritchie, medical officer of health for Dumfries, as a member of the General Medical Council. Dr. Ritchie takes the place of the late Sir Leslie Mackenzie as Crown nominee for Scotland.

Dr. A. G. W. Thomson has been appointed a commissioner of the General Board of Control for Scotland in succession to the late Dr. J. P. Sturrock.

THE next session of the General Medical Council will open at 2 P.M. on Tuesday, May 28th, under the presidency of Sir Norman Walker.

THE Cambridge University Press will publish shortly an annotated list of medical practitioners in the diocese of London, 1529–1725, licensed under the Act of Parliament 3 Henry VIII., cap. 11. The object of this short book is to show in what manner the Bishops of London handled their great and serious responsibility respecting the licensing of medical practitioners.

PROGNOSIS

A Series of Signed Articles contributed by invitation

LII.—PROGNOSIS OF BRONCHIECTASIS IN CHILDREN

UNTIL the introduction of lipiodol in radiography of the chest by Sicard and Forestier (1922), opinions on the prognosis in bronchiectasis in children were for the most part pessimistic. This is readily understood on reviewing the criteria formerly required for a diagnosis of bronchiectasis on physical signs alone—dullness at the base with bronchial breath-sounds and moist crepitations, chronic cough, worse in the morning with copious muco-purulent sputum, clubbing of the fingers, and cyanosis. Such a picture is uncommon in childhood; it represents merely an advanced state of pulmonary crippling, and the expectation of life of those manifesting such changes could only be unfavourable. From the evidence provided by lipiodol investigations, we now know that bronchiectasis may be present and give rise to very few symptoms, and also that it is a much more common condition in children than was formerly supposed. Bronchial dilatation, in fact, cannot be diagnosed in its early stages without the aid of lipiodol. The prognosis therefore has required revision and tends to be more hopeful, but is still in a stage of determination.

CLINICAL ASPECT OF ACQUIRED BRONCHIECTASIS

The type of case in which bronchial dilatation may be suspected presents clinically the physical signs of pulmonary fibrosis, but these are often so inconspicuous that an examination depending on auscultation and percussion gives little information on the condition of the lung. Of greater significance is the fact that there is almost always a past history of pneumonia (broncho-pneumonia), often associated with measles, whooping-cough, or influenza. The child is brought to the doctor because of a persistent cough in the daytime, which gets worse in winter. The cough is not spasmodic, and is usually unproductive. Sputum, when present, consists of thick tenacious mucus, and only in advanced cases is it purulent and evil-smelling from additional infection with putrefactive organisms. Vomiting provoked by the cough is a suggestive symptom, and in a few cases hæmoptysis has been recorded. The child is often several pounds below the proper weight for its age. Dyspnœa on exertion, cyanosis, and clubbing of the fingers are signs of severe pulmonary involvement in chronic cases.

Physical signs to some degree are usually found to be present when the chest is examined, though they may be slight. They include dullness on percussion at one or both bases, possibly with displacement of the heart towards the most affected side, weak breath sounds but seldom bronchial breathing, and in some cases moist râles. A diminished expansion of the lower part of the chest on the affected side may also be observed.

RADIOGRAPHY AND LIPIODOL

By X rays alone one of two conditions may be revealed: (1) The common form is fibrosis denoted by excessive root shadows and heavy streaky shadows running from the hilum towards the diaphragm. During inspiration the diaphragm on the affected side often does not descend so fully as on the opposite side. (2) Collapse of a lower lobe. In this type of case there is a triangular shadow at one or other base, the spine and diaphragm forming two borders of the triangle, and the visible border or hypotenuse reaching from the hilum to some point along the phrenic surface. With lipiodol injection the presence of bronchiectasis is confirmed or disproved. In either of the two conditions, interstitial pneumonia or lobar collapse, bronchial dilatation is liable to occur. The mechanism of its production is thought to depend chiefly upon inspiratory effort, especially that which follows the act of coughing. With expansion of the chest wall a negative intrathoracic pressure occurs, causing air to enter the alveoli. If this is prevented locally by the accumulation of thick tenacious mucus, the obstructed bronchioles tend to dilate. Other explanations of dilatation are that it is the effect of fibrous traction, which can rarely be proved, or of accumulation of septic sputum in weakened bronchi, which only occurs in the "wet" type of bronchiectasis. The dilatation may be saccular or cylindrical, the latter form being common when there is collapse of a lobe. In this atelectatic type of bronchiectasis the triangular shadow on the spino-phrenic angle represents collapse of the whole of a lower lobe. With lipiodol the outline of a main bronchus can be seen entering the triangular area.

There are three methods of injecting lipiodol (10 to 15 c.cm.): (*a*) the intratracheal route, by direct introduction through a catheter; (*b*) the cricothyroid route, by means of a cannula; and (*c*) through a nasal catheter reaching the trachea. The best and safest method for children is (*a*) the intratracheal route, though this necessitates general anæsthesia by ether, which requires to be fairly deep. Points against (*b*) and (*c*) are, that in (*b*) surgical emphysema of the mediastinum has been known to occur and to prove fatal, and in (*c*) there is uncertainty whether the lipiodol will enter the trachea in sufficient quantity; moreover, to suppress the cough reflex spraying with cocaine will probably be required, and this is a dangerous procedure in children. In (*a*) the amount of discomfort and coughing involved by the injection of the lipiodol is usually slight. The method demands a high degree of technical skill.

The injection of lipiodol is not advocated for every patient presenting signs of pulmonary fibrosis in which bronchial dilatation is suspected, but the accurate information obtained justifies its use in cases requiring prolonged treatment, and especially when it is desired to ascertain the state of the bronchioles in a collapsed lobe.

THE OUTLOOK

The outlook depends upon whether the bronchiectasis remains "dry" with little or no sputum, or becomes "wet" with purulent sputum. Age has some influence. Cases commencing in infancy have a high mortality with a short period of survival. In those with onset at a later period bronchiectasis may be present for many years, even into late adult life without the incidence of sepsis. Cases of recovery have been described, where on subsequent lipiodol examination all traces of bronchial dilatation have disappeared. This result, however, is rare in the atelectatic type of bronchiectasis, in which the collapse is usually permanent. As Anspach has indicated, the smaller and denser the triangular shadow remains, from absence of re-expansion, the worse the prognosis. An unfavourable sign in bronchiectasis is the recurrence of febrile attacks with

increase of cough and of physical signs in the chest, signifying renewal of pulmonary inflammation. Infections of the upper respiratory passages, throat, antra, ears, are often mentioned as predisposing to advance of the bronchiectatic process, but in some cases they are probably secondary not primary, arising from infection ascending from the lung.

In children with bronchiectasis open-air treatment, including open-air schools, is of great benefit. For the atelectatic type efforts should be made to re-expand the collapsed portion of lung by breathing exercises and CO_2 inhalations. When the collapse is permanent, lobectomy may in the future become the best means of treatment. As the child gets older, choice of occupation, avoiding dust-laden, close, or over-heated atmospheres, is a matter of considerable importance.

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SPECIAL ARTICLES

THE TREATMENT OF EARLY SYPHILIS

A REPORT OF AN EXPERT COMMITTEE OF THE LEAGUE OF NATIONS

THE Health Organisation of the League of Nations publishes [1] the results of an inquiry into syphilis treatment carried out in five countries (Denmark, France, Germany, Great Britain, United States of America); 93 clinics in these countries have contributed to the inquiry and 13,198 case-records of primary and secondary syphilis have been analysed.

Guided by the principles revealed by the study of these records, the experts who have collaborated [2] have adopted the following recommendations which are of great interest to syphilologists, public health officers, and private practitioners:—

1. Treatment should be recommended as early as possible in the sero-negative primary stage. In this connexion, the fullest possible use should be made, for purposes of diagnosis, of the microscopical examination of secretion from primary lesions, or from lymph glands.

2. It should be emphasised that, prior to the institution of either of the systems of treatment outlined below, there should be an adequate physical examination to determine the absence or otherwise of any indication for caution in respect of the dosage.

3. *It is essential that, in carrying out the treatment, a strict supervision of the patient be exercised, especially in respect of mucous membranes, skin, kidneys, and liver.*

4. Observation, clinical and serological, after completion of treatment should be adequate and in any case for not less than three years.

5. Adequate examination of the spinal fluid, at least before dismissal from observation, is essential.

6. The principles to be followed in carrying out the actual treatment should be as follows:—

(*a*) To employ a comparatively heavy individual dosage of the arsenobenzene and of the bismuth or mercurial compounds, the doses being administered in comparatively rapid succession, especially at the commencement.

(*b*) To maintain a persistent attack on the disease, avoiding intervals of such length as to afford the parasite an opportunity of recovering.

(*c*) To administer approximately as much treatment to primary as to secondary cases.

7. The material studied does not enable a clear decision to be made as to the relative merits of intermittent treatment, with courses of injections in rapid succession separated by rest intervals of some weeks, and continuous treatment, or between the simultaneous employment of both arsenical and bismuth or mercury and the system in which bismuth and mercury are withheld until a number of arsenical injections have been administered.

Nevertheless it seems practicable from the results of the analysis and from the personal experience of the experts to formulate a system of intermittent treatment and one of continuous treatment either of which can be expected to yield satisfactory results in ordinary cases of early syphilis.

It seems possible that the intermittent treatment which is suggested below may in effect be continuous, or practically continuous, treatment owing to the continued absorption of bismuth from the sites of the injection for some weeks after any temporary suspension of the treatment.

Plan of Intermittent Treatment

1. *Males.*—For adult males of average weight aged less than 50 years and in whom there is no contra-indication, a number of courses of injections on the plan described below (Table I.). It should be said that, at the beginning of this course, some administer at once the full weekly dose (0·60 to 0·75 gramme), while others divide it into two doses (e.g., 0·30 and 0·45 g.) so far as the first week is concerned.

TABLE I.—*Weekly Dosage*

Weeks.	"914" (gramme).	"606" (gramme).	Insoluble compound of bismuth containing bi-metal *; (gramme).
1st to 8th	0·60 to 0·75 or	0·4 to 0·5 and	0·20 to 0·24
9th	—	—	0·20 to 0·24
10th	—	—	0·20 to 0·24

* 1. By *insoluble* bismuth is here meant compounds of a very slight solubility in water. They should therefore be given in suspension, those of extremely slight solubility (the oxychloride, &c.) usually in a watery suspension, those that are more soluble (the subsalicylate, the iodo-bismuthate of quinine, the alkaline tartrates, &c.) suspended in a vegetable oil. If a *liposoluble* compound (e.g., the camphocarboxylate, &c.) is preferred, it is desirable that the injection be given twice weekly in half doses.
The dosage of all bismuth compounds should be calculated according to their content in bismuth metal.
2. As an alternative to bismuth, a course of mercury may be given, either in the form of inunctions (40 days at 3 g. of unguentum hydrargyri) or of injections (70 mg. calomel or 120 mg. salicylate of mercury, &c., suspended in a suitable base).

It is recommended that: (*a*) In cases which remain

[1] Quarterly Bulletin of the Health Organisation, vol. iv., No. 1, March, 1935.

[2] Prof. J. JADASSOHN, former director of the Dermatological Clinic of the University of Breslau; Colonel L. W. HARRISON, Technical Adviser in Venereal Diseases, Ministry of Health, London; Prof. TH. MADSEN, Director of the State Serotherapeutic Institute, Copenhagen; Prof. LOUIS QUEYRAT, President of the Ligue nationale française contre le péril vénérien; Prof. Queyrat died and was succeeded by Prof. H. GOUGEROT, Director of the Clinique des maladies cutanées et syphilitiques de la Faculté de Médecine de Paris (Hôpital St. Louis); Prof. C. RASCH, Director of the State Hospital, Copenhagen, whose place was occasionally taken by Dr. SVEND LOMHOLT, Director of the Dermatological Clinic of Finsens Lysinstitut, Copenhagen; Dr. JOHN H. STOKES, Professor of Dermatology and Syphilology, School of Medicine, University of Pennsylvania, Philadelphia. Rapporteur: Prof. HANS MARTENSTEIN, Director of the Dermatological Clinic, Municipal Hospital, Dresden-Friedrichstadt.

TABLE II.—PLAN OF ALTERNATING CONTINUOUS TREATMENT FOR EARLY SYPHILIS

—	"606" (gramme).	Interim treatment.	Serol. test.	Remarks.
Day.				
1	0·3–0·6	.....	1	"606" dosage for first 3 injections at level of 0·1 gramme for each 25 pounds (11·3 kg.) body-weight. Average subsequent dosage, 0·4 gramme, men; 0·3 gramme, women, the fourth and subsequent injections in the first course at weekly intervals. In average patient, all lesions heal rapidly and blood serological reaction becomes negative during first course. If "606" cannot be used, substitute 8 to 10 doses 0·3 gramme silver arsphenamine (silver salvarsan, silver arsenobenzol, &c., or 10–12 doses "914" (0·45–0·6 gramme maximum for women and 0·6–0·75 gramme for men). This applies also to subsequent courses.
5	0·3–0·6			
10	0·3–0·6			
Week.				
3	0·4			
4	0·4			
5	0·4			
6	0·4			
7	0·4	.....	1	If mercury is used; note overlap of 1 week at end of first and start of second "606" courses. At this point a few days without treatment may be dangerous. Neuro-relapse.
8	.....	Bismuth, 4 doses, 0·2 gramme and K.I., or Ungt. Hg. and K.I.		
9				
10				
11				
12	0·4	.....	1	"606" starts, bismuth stops. Watch for provocative serologic reaction after first dose of "606." Try to prevent short lapses in treatment, especially at this early stage.
13	0·4	.....	1	
14	0·4	.....	....	
15	0·4			
16	0·4			
17	0·4	.....	1	
18–23	.....	Bismuth, 6 doses, or Ungt. Hg. and K.I.	....	Bismuth is better than mercury. Use if possible. Examine cerebro-spinal fluid if patient's coöperation can be secured at about this time. If found to be abnormal, continue or intensify treatment as required, re-examining fluid within six months.
24	0·4			
25	0·4			
26	0·4			
27	0·4			
28	0·4			
29	0·4			
30–37	.....	Bismuth, 8 doses or Ungt. Hg. and K.I.	....	
38	0·4	.....	1	
39	0·4			
40	0·4			
41	0·4			
42	0·4			
43	0·4	.....	1	
44–53	.....	Bismuth, 10 doses or Ungt. Hg. and K.I.	....	Note that bismuth or mercury courses are gradually getting longer—4, 6, 8, and now 10 weeks.
54	0·4	.....	1	
55	0·4	.....	....	The average sero-negative, sero-positive primary or early secondary patient should have at least 5 courses of "606."
56	0·4			
57	0·4			
58	0·4			
59	0·4	.....	1	
60–69	.....	Bismuth, 10 doses or Ungt. Hg. and K.I.	....	It is safer to finish treatment with bismuth or mercury rather than with "606."
70–122	Probation.	No treatment.	6–12	
123	Complete physical and neurological examination, lumbar puncture, and, if possible, fluoroscopic examination of heart and great vessels.			

or become serologically negative during, or by the end of, the first course four such courses be administered, with intervals of three to five weeks between any two courses.

(*b*) In cases which have not become sero-negative by the end of the first course, in addition to the amount of treatment shown in (*a*), further courses should be administered until the patient has received as a minimum three beyond that which has ended with negative serum reactions. At the option of the individual clinician, this treatment may be prolonged as may be considered necessary.

(*c*) Cases presenting signs of clinical relapse of an early type should be dealt with on principles similar to those enunciated in (*b*).

2. *Females.*—For females (non-pregnant), treatment should be administered on the plan outlined for men with the exception that the single dose of "914" should be reduced by 0·15 g. and that of "606" by 0·1 g.

In the event of any reduction in the amount of treatment being indicated it is recommended that this be effected by reducing the number of arsenical injections rather than by reducing the individual dose or increasing the intervals.

Plan of Continuous Treatment

The plan of continuous treatment is as shown in Table II. and the succeeding paragraphs.

As an optional scheme more in harmony with the trend toward longer courses, three series of ten to twelve injections each of the arsenical drugs may be given. To secure an overlapping of the heavy metal and the arsenical, believed by some observers to protect against neuro-relapses, begin the bismuth two, three, or even four injections before the end of the longer arsenical course, continue it through the period in which the arsenical is suspended, and on into the beginning of the next arsenical course. The bismuth is then suspended while the arsenical course is completed.

The bismuth salt advised for this system is bismuth salicylate in oil suspension, in full adult dosage with due regard for weight. Other preparations of bismuth may be used only with due regard for an equivalent metallic content and for their rate of elimination. The mercurial inunction is 50 per cent. metallic mercury in a suitable fatty base, dose 4 g. per inunction, five to six inunctions per week. The use of the iodide is optional, depending on indications.

The use of insoluble mercurials intramuscularly in this system is *not* recommended.

It should be further understood that when heavy metal is employed after the last "606" course, the heavy metal courses are to be separated by rest intervals of six to eight weeks between each series of ten weeks injections, or each course of 40 inunctions.

In cases of primary syphilis which have remained sero-negative throughout, a minimum of five courses of "606" or "914" should be given. Cases of sero-positive primary syphilis should receive the full treatment called for by this system.

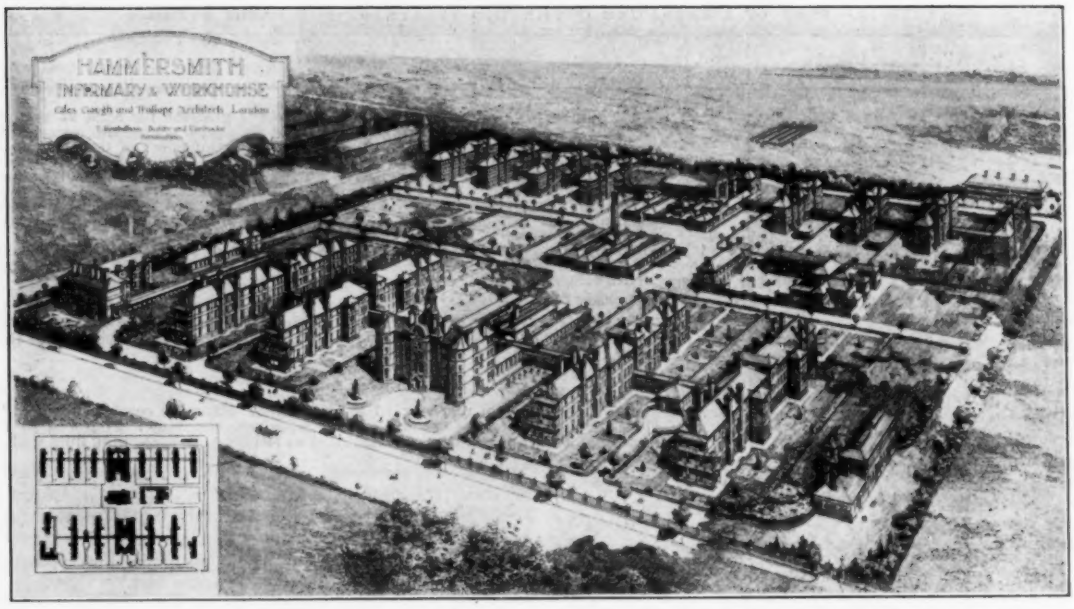

FIG. 1.—A bird's eye view of the Hammersmith Hospital as it was planned in 1905 by the architects, Messrs. Giles, Gough, and Trollope, but not then fully carried out from reasons of economy. The new out-patient department and the medical school building now make up the south-east block and complete the original scheme in this respect. The buildings of the institution to the north still afford great scope for future development.*

POST-GRADUATE MEDICAL TEACHING

PROGRAMME OF THE NEW HAMMERSMITH SCHOOL

THERE is something of adventure about the curriculum of the British Postgraduate Medical School opened by the King this week, for the staff has been taken from many parts of the Empire, the chairs of other Universities have been rifled, and the dean has been chosen from among distinguished administrative officers of the Indian Medical Service. The history of the school's development has already been told in these columns, with an account of the buildings themselves. What follows is intended simply to give an indication of the way in which post-graduate teaching is to take its course at present. Staff and equipment are there. Students have only been admitted officially since May 1st. They will be drawn from many sources, and it is hardly likely that the school will attain its greatest usefulness until arrangements are made for resident students. Many of the features suggested are still in the making; the most striking feature of the whole is the small provision made for the lecture type of teaching and the large provision for bringing students into personal contact with cases. In what follows we are much indebted to the dean and the heads of the four departments.

Department of Medicine

This department has charge of 170–180 beds distributed in six large wards. The full-time staff of the department consists of :—

Professor	4 First assistants
Reader	5 House physicians

and one assistant medical officer of the L.C.C. service who acts as resident medical officer. The first assistants are chosen for their expert knowledge of one or other of the various branches of medicine, such as neurology, respiratory and cardiovascular diseases, endocrinology, infections, in order that the specialised knowledge of the staff may cover a wide field. It is obvious that at any one time all the branches of medicine in which special knowledge is required cannot be represented on the staff, and to fill these gaps consultants have been appointed who visit the hospital at stated intervals, and at other times when their services are required. In the future it is hoped that additional departments, such as psychological medicine and diseases in childhood, may be added.

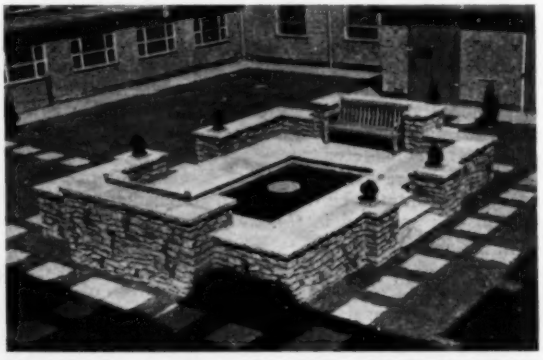

FIG. 2.—The fountain in the court of the school building which will no doubt become an informal consultation centre.

Each senior non-resident member of the staff, with a resident house physician, has charge of 25–30 beds. In addition to this duty each first assistant will give his expert special knowledge for the diagnosis and treatment of cases coming under his specialty throughout the wards of the department.

* With the exception of this photograph which we owe to the courtesy of the architects, all the other pictures in this article were specially taken for the purpose by Mr. C. M. Braithwaite, 103, Victoria-parade, Moseley, Birmingham, from whom prints of any of them can be obtained.

In this way he will obtain material for his investigations and research and, at the same time, by means of the beds of which he is in charge and to which cases of all kinds are admitted, he will keep up his knowledge of general medicine. Each senior member of the staff will hold a consultative out-patient session on one morning a week, when he will see cases referred to him from the casualty department and patients discharged from the wards who require further treatment at the hospital or whose progress he desires to follow.

The house physicians and the officer loaned from the London County Council service are resident. The former will be recruited from the graduate students who have attended courses at the school. By allotting a comparatively small number of beds to each house physician opportunities are provided for them to study for higher degrees, prepare theses, attend other general or special hospitals, work in the laboratories, engage in research, and so forth. The house physicians are responsible for carrying out treatment and for the patients' records.

A small laboratory has been provided adjacent to each ward where simple laboratory tests can be carried out. Plans have been prepared for a series of laboratories for the physiological investigation of patients, including galvanometer rooms for work on the cardiovascular system, rooms for testing respiratory functions, basal metabolism, &c., and their construction is to be commenced immediately.

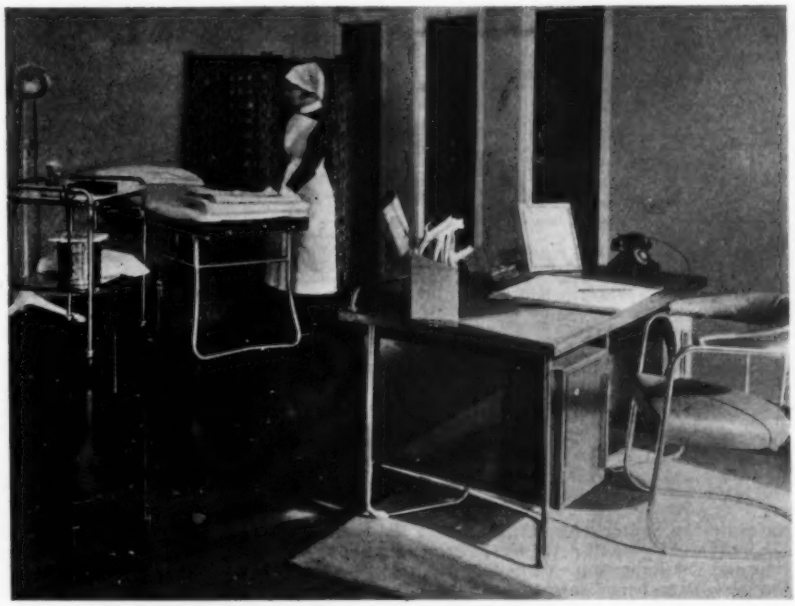

FIG. 4.—Physicians' examining room in the medical out-patient department. There are two large rooms as the one illustrated and two smaller rooms. The larger rooms are suitable for teaching. Entrance to the dressing rooms is seen behind.

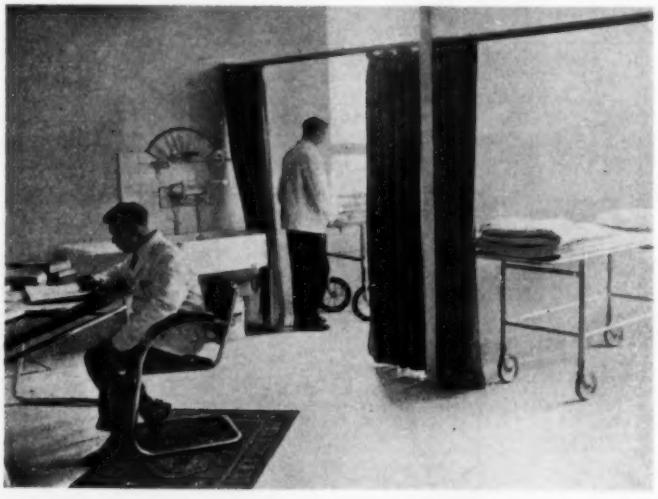

FIG. 3.—Receiving room in the new out-patient department. There are two such rooms, one for female patients and one for male. Patients are seen in these rooms at all times and may be dealt with immediately by the casualty medical officers, referred to the out-patient departments which are consultative, or admitted to the hospital.

COURSES OF INSTRUCTION

I.—Instruction in clinical medicine will be provided by appointments to the wards of graduate students in small numbers (about 15 students to 60 beds) for periods of three or more months. They will be allotted cases to which they will act as clinical clerks, recording fully the histories, physical findings and progress, aiding the house physician in carrying out treatment, and carrying out the simpler laboratory investigations that can be made in the ward laboratories. Bedside clinics or ward rounds will be held on two mornings (11.30 A.M.–1 P.M.) a week with the small group of students working in a ward, and on two mornings a week theatre clinics will be given by the professor or the reader for the whole number working in the department. On a fifth morning there will be a clinical-pathological conference at which all the students will attend, and on one afternoon a demonstration of X rays will be given by the lecturer in radiology. Post-mortem examinations are held daily, and demonstrations are given at 1.30 P.M. On most afternoons the students will be free to study their own cases, attend other general or special hospitals, or work for examinations. A good working library is provided.

II.—On three mornings a week out-patient sessions are held. These are consultative in character, cases being referred to them from the casualty department, and at them cases discharged from the wards and requiring further advice are seen also. Small numbers of students working in the wards assist at these sessions.

III.—Intensive courses for practitioners, lasting two weeks, will be given as frequently as practicable. In these courses a disease or group of diseases would be considered in a wide manner to illustrate the natural history of the process, the clinical manifestations, the physiology, pathology, and treatment. Clinical pathology, laboratory and X ray methods of diagnosis would be demonstrated. Subjects covered might include discussions—e.g., on (1) the place medicine and the doctor are taking in modern

A SPECIMEN WEEK OF INSTRUCTION IN CLINICAL MEDICINE

—	10–11.30.	11.30–1.	1.30–2.	2–3.	3–4.
Monday	Ward rounds by staff and ward work by students.	Ward clinic by staff to students in small groups.	Post-mortems.	Ward work by staff and by students.	Ward work by staff and by students.
Tuesday ..	Ward rounds by staff and ward work by students.	Theatre clinic. Dr. Aitken.	do.	do.	do.
	• Prof. Fraser. • Dr. Stuart Harris. } Out-patients.				
Wednesday ..	Ward round, staff only. Ward work by students.	(12–1.) Clinico-pathological conference.	do.	do.	do.
Thursday ..	Ward rounds by staff and ward work by students.	Ward clinics by staff to students in small groups.	do.	Radiological conference. Wards closed.	—
	• Dr. Wood.	Out-patients.			
Friday	Staff and students in wards.	Theatre clinic. Prof. Fraser.	do.	As on Monday.	
Saturday ..	Students in wards.		—	—	—
	• Dr. Aitken. • Dr. Jennings. } Out-patients.				

• Students will attend out-patient department with the member of the staff to whom they are attached.

society; the doctor's responsibilities to the State and to his individual patient; (2) methods of clinical examination and the importance of history taking; the study of the patient and medical psychology; (3) the physiology of the mind; (4) infections of the upper respiratory passages, acute and chronic; (5) chronic arthritis; (6) dyspepsia. In each case at least one outside member of the profession, expert in some branch of medical practice, would take part. This year it is proposed to hold such courses in June, July, September, and November; the number of practitioners attending will be limited to 25. The work will be as practical as possible and will include medicine, surgery, obstetrics, and pathology.

IV.—It is proposed to arrange a series of lectures and demonstrations on one afternoon or evening a week during the winter at a time suitable for practitioners in London. A series of subjects would be covered.

V.—Members of the medical profession, other than those on the whole-time staff of the school, will be invited to take part as teachers in the refresher courses and at the weekly lectures (III. and IV. as above). In this way the benefit of expert teachers in a large variety of subjects from London and elsewhere will be available for post-graduate instruction.

VI.—It is hoped that special lectures may be arranged to be given by distinguished visitors to London from

A SPECIMEN INTENSIVE COURSE FOR PRACTITIONERS

FIRST WEEK

—	10.30–1.0.	Conducted by—	2.0–4.30.	Conducted by—
Monday ..	Principles of the examination of patients.	Prof. Fraser and the medical staff of the school.	General principles in the treatment of Fractures.	Mr. Lambert Rogers and surgical staff.
Tuesday ..	At the Central London Throat, Nose, and Ear Hospital, Grays Inn-road.		At the London School of Dermatology, St. John's Hospital, Leicester-square.	
Wednesday ..	Natural history, diagnosis and treatment of Peptic Ulcer and various types of Functional Dyspepsias.	Dr. J. A. Ryle and the staff of the school, including the pathological and radiological staff.	Continuation of the same subject.	The same staff.
Thursday ..	Common types of Anæmia: their diagnosis and treatment.	Dr. Janet Vaughan and the staff of the school.	Demonstration of Obstetrical Cases.	Prof. Young and the staff of the school.
Friday	Antenatal Examination.	Prof. Young and staff.	Common Gynæcological Conditions.	Dr. Chassar Moir.
Saturday ..	Psychology in General Practice.	Dr. Edward Mapother.	—	—

SECOND WEEK

Monday ..	Gastric Carcinoma: its diagnosis and treatment.	Prof. Grey Turner and the staff of the school.	Heart Disease and Heart Failure.	Prof. Fraser and the medical staff of the school.
Tuesday ..	At Great Ormond-street Children's Hospital.		At Great Ormond-street Children's Hospital.	
Wednesday ..	Chronic Arthritis.	Dr. C. W. Buckley and the staff of the school.	Chronic Rheumatic Affections.	Dr. Buckley and the staff of the school.
Thursday ..	Some common Respiratory Diseases.	Dr. J. G. Scadding and the staff of the school.	Pulmonary Tuberculosis in General Practice.	Dr. L. S. T. Burrell and the staff of the school.
Friday	Head Injuries.	Mr. Lambert Rogers and the staff of the school.	The diagnosis of Acute Abdominal Conditions.	Prof. Grey Turner and the surgical staff of the school.
Saturday ..	Demonstration of Local Anæsthesia.	Dr. R. E. Apperly and the surgical staff of the school.	(12.30–1.30.) Discussion on the requirements of a Post-graduate Refresher Course.	Members of the class.

this country or from abroad as often as possible. In suitable instances the visitor will be invited to take charge of wards for a time and take part in the routine work of the hospital and school.

VII.—Graduates who are carrying out investigations and require clinical material for their researches can be accommodated in small numbers. It has not been possible as yet to provide laboratories for the department of medicine other than the ward side-rooms, but the plans for such laboratories have been prepared and their construction is to be commenced immediately. It will be possible to accommodate more research workers when these are completed.

VIII.—Graduate students attending for shorter periods than a month can be accepted in small numbers, but it may not be possible to arrange special courses of work for them. If they desire to study a special branch of medicine it may be possible to attach them to a member of the staff working in that special branch.

IX.—Visitors for short periods will always be welcomed, and arrangements will be made to enable them to attend and to see whatever aspect of the work of the department they desire.

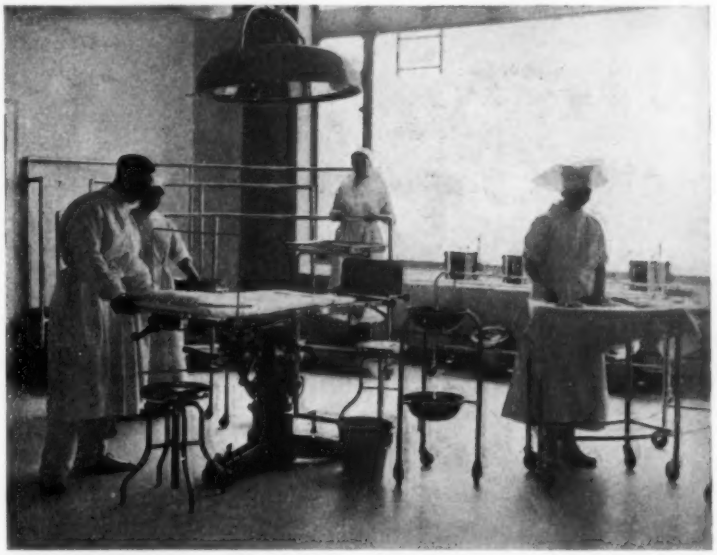

FIG. 6.—One of two new operating theatres on the top floor of the new hospital wing. In the background is seen a movable gallery for visitors. The sterilising room is common to the two theatres. The anæsthetic rooms adjoining can be darkened and used as adjuncts to the theatres for examinations or operations best conducted in artificial light. The surgeon's room is fitted for smaller demonstrations such as can be carried out between operations. A laboratory is provided in close proximity to the theatre.

Department of Surgery

Much of what has been said about the department of medicine applies in general to the department of surgery. At the moment the number of beds is rather less, 120 to 130, but next year it is intended to add another 50 in a new block of which plans have been approved. The staff is on the same basis as for the medical department though slightly fewer in number and consists of

Professor..Reader..2 First Assistants..4 House Surgeons

and an experienced L.C.C. officer who acts as emergency surgeon and liaison officer. The members of the staff have all some special experience: the reader in neurological surgery, one assistant in urology, and the other in fracture work and orthopædics. The staff will thus include, beside the professor and the reader, three other members, one of whom will act in the capacity of resident surgeon, dealing with emergencies at such times as the visiting staff is not available. The other two members, of the standing of senior surgical registrars, will carry out and supervise special investigations, pre- and post-operative treatment and so forth. Each will have some special line in which his experience is valuable and which he will have the opportunity of developing. Four house surgeons have been appointed, their periods overlapping so that some would always be accustomed to the running of the unit. A considerable part of the teaching will be carried out in the demonstration theatre to which patients can be wheeled from ward and out-patient department. Ward visits, however convenient and delightful, are only suitable for demonstrating to a limited number and have the drawback that the remarks of the teacher have to be regulated to avoid hurting the feelings of the patient or other persons in the ward. Certain classes will also be held in the out-

FIG. 5.—One of the two lecture theatres. The one on the ground floor, used as a clinical theatre, is fitted with projection lantern and cinematographic apparatus. Each of the theatres can accommodate about 100 students.

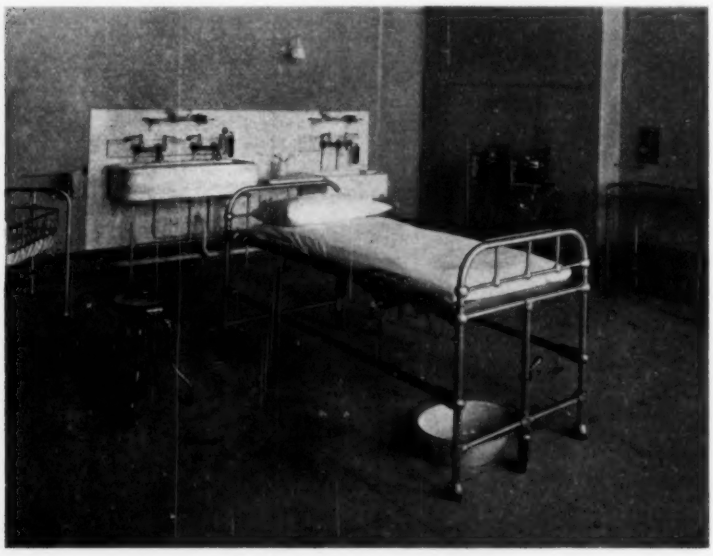

FIG. 8.—One of the labour rooms.

patient department. It is intended that some teaching should be going on every day of the year so that no visitor from a distance, however pressed for time, should ever be disappointed. The different groups of students will be roughly the same as those enumerated under the medical department. A general laboratory will be set aside for surgery, for each member of the unit should be engaged in some sort of research. Daily conferences will be held among the staff regarding matters of interest to which students will be welcome. For the rest the department will develop as the work demands and resources permit.

In this department it is not intended to hold coaching classes preparatory for special examinations, but the work will be of such a type as to be useful to that end. The aim is to make the patient the centre of the student's activities. Continuity will be preserved by arranging for students to see the cases as they come into hospital, to observe all the necessary examinations and investigations, to see the operations and detailed after-care; in the event of recovery to see the patient from time to time in the follow-up department, and should death follow to see the autopsy and have the pathology demonstrated, thus establishing continuity without the intervening delays that so often occur in hospital practice. Some of the students will be attached to the wards, where cases will be allocated for their own care and observation. The resources of the L.C.C. should be sufficient to provide numbers of any special group of cases it is decided to study. There will no doubt be opportunity to see chronic cases such as are commonly excluded from ordinary hospitals, including inoperable malignant disease. Some lecture or demonstration courses may be given, but they will not be looked upon as so important as the clinical demonstrations of actual cases. Reviews or symposia on recent advances, as in the surgery of chest, œsophagus, or sympathetic nervous system, will be given from time to time. Afternoons are to be left comparatively free for research by members of the staff, or sometimes students, and for the latter to profit by paying visits to other teaching centres in London.

THE SURGICAL WEEK

—	10.30 to 1.	1.30 to 2.	2 to 4.
Monday ..	Staff round and ward clinics.	Post-mortems.	Round continued.
Tuesday ..	Operations and operative clinic by Professor. Ward work by assistants.		Fracture Clinic.
Wednesday ..	Ward visit by Professor followed by out-patients.		Clinical Conference.
Thursday ..	Operations and operative clinic by Professor. Ward visit by Reader.		—
Friday ..	Ward visit by Professor. Operations by Reader.		—
Saturday ..	Ward work by assistants.		—

Department of Obstetrics and Gynæcology

The obstetric and gynæcological unit is situated in the new block of the hospital and in the adjacent pavilion. It contains about 60 beds. In the course of the next year the new block is to be extended to the south, giving an extra pavilion and an additional 50 beds. The gynæcological theatre is Sir Robert Jones's fine operating-room now surrendered by the general surgeon. The antenatal clinic is part of the general out-patient department with a separate entrance of its own. The second floor of the unit is

FIG. 7.—Part of one of the lying-in wards.

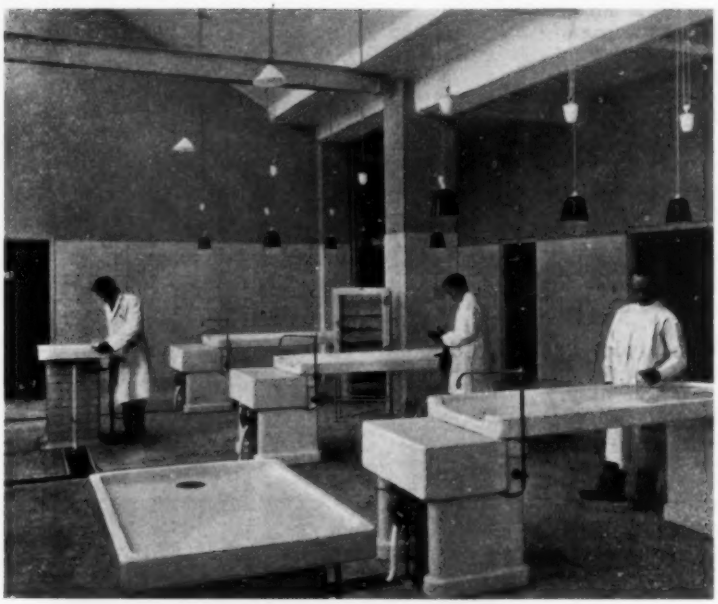

FIG. 9.—The post-mortem room.

devoted entirely to the delivery of "clean" cases. These are for the most part women who have been under antenatal control by the unit. The first floor is for the delivery of "suspect" cases—that is, cases which are admitted as emergencies. In many instances they will have been in labour before admission and are sent to hospital because of some complication. These cases are always a source of possible contamination and it is for this reason that they are being segregated in a special department with its own delivery room and nursing staff. There is also on this floor a ward for antenatal cases which are admitted to hospital for such complications as toxæmia or pyelitis. After delivery the suspect cases are retained on this floor during their lying-in period. No woman with frank puerperal infection will be admitted to the unit. It is hoped to expand the antenatal department into a larger unit on some spare ground in the near vicinity of the obstetric block. When this is done there will be adequate accommodation for antenatal, postnatal, and general follow-up clinics.

Teaching will be essentially clinical with a minimum of ordinary systematic instruction. The student will be brought into intimate contact with the clinical problems of diagnosis, treatment, and prognosis by means of bedside study and instruction. As far as practicable he will take a share in the conduct of the unit, receiving every facility to become familiar with the ancillary methods of investigation, radiology, biochemistry, pathology, and endocrinology. At the antenatal and postnatal clinics classes will consist of small groups, no more than three or four at a time. During the first phase the post-graduate school will have access to the clinical material of two other L.C.C. hospitals—St. Mary Abbots and Fulham. The former, which is within 15 minutes' drive of Hammersmith, has an obstetric and gynæcological clinic of about 90 beds. Instruction in infant hygiene will form part of the routine instruction, and to this end a pædiatrician has been attached to the hospital who will give regular instruction in the management of the healthy infant and in the care of the ailing child.

On one day of the week practitioners in the neighbourhood and others likely to be interested will be invited to clinical discussions and demonstrations. This, we believe, should become a useful part of our routine work and will have the incidental advantage of bringing the department into touch with the doctors who provide the hospital with its clinical material. Research will mainly be directed to clinical ends. Students with the necessary qualifications will be encouraged to participate and it is hoped to arrange for hospitality to others desirous of carrying out research along definite lines, and when funds are available to establish a department for special investigations into the physiology and the endocrinology of reproduction, especially in their clinical relationships.

Department of Pathology

As an integral part of a post-graduate school this department will coöperate in the closest possible way with the various clinical departments in those activities of the school which are common to all.

A ROUTINE WEEK IN THE DEPARTMENT OF OBSTETRICS AND GYNÆCOLOGY

—	10–11.	11–12.	12–1.	2–3.	3–4.
Monday	Gynæcological operations. Ward round by staff. Clinical instruction and discussion of cases.			Antenatal clinic for students in small groups. Ward work for staff and students.	
Tuesday	Ward round by staff and ward work, &c., by students. Clinical instruction and discussion of cases.			Antenatal clinic for students in small groups. Ward work for staff and students.	
Wednesday ..	Gynæcological operations. Gynæcological out-patients and clinical instruction.			Postnatal clinic for students in small groups. Infants' follow-up clinic for students in small groups.	
Thursday ..	Pædiatric clinic: Dr. Alan Moncrieff. Clinical instruction and discussion of cases.			Radiological conference. Clinico-pathological conference.	
Friday	Antenatal clinic for students in small groups. Ward round by staff and ward work by students. Discussion of antenatal cases for all students.			Staff conference. Clinical demonstration for students and visitors.	
Saturday.. ..	Ward round by staff.			—	

Labour room instruction on normal and abnormal cases will be given as circumstances allow.

It will thus take a part, though probably a minor one, in "refresher" courses and participate to some extent in other activities of a similar nature. The special object of the department will be to provide medical men and women with facilities for advanced study in all branches of pathology. Such students will be of two main types :—

(A) Those who desire to gain general training and experience in one or more branches of the subject.
(B) Those who wish to devote themselves to the investigation of some particular problem.

The department will in fact be concerned with students of pathology rather than with students of medicine to whom pathology is but one of several subjects engaging their attention.

In order to meet the needs of such students, especially those in Group A, the department must have access to teaching material. This can only be obtained from the routine pathological services of the hospital, and the department will therefore be responsible for these services. Such an arrangement has the advantage of ensuring that close association between the clinical and the laboratory sides which is so desirable. While chiefly concerned with the problems of the student of pathology, an important function of the department will be to collaborate with members of the clinical departments in combined investigations and to provide facilities and assistance to members of the staffs of these departments who may wish to undertake personal laboratory work. The successful development of a department of this kind demands that every member of its staff shall be actively engaged in research, for an institute which will attract serious students of pathology who wish to undertake original investigations, and to be trained in the methods of research, can only be built up if the staff are themselves students and not merely teachers. For this reason care has been taken to provide a staff sufficiently large to ensure that each individual may have adequate time, apart from his routine duties, to devote to his personal work. The organisation of the department provides for readerships in morbid anatomy and histology, bacteriology, and pathological chemistry; and each reader will have at least one assistant. Students can be admitted into any one of these three subdepartments, or divide their time among two or all of them. There is, in addition, a subdepartment of clinical pathology where candidates for the University diploma in clinical pathology will find their requirements met.

Instruction in pathology at the Hammersmith school will be of a very personal character. Students

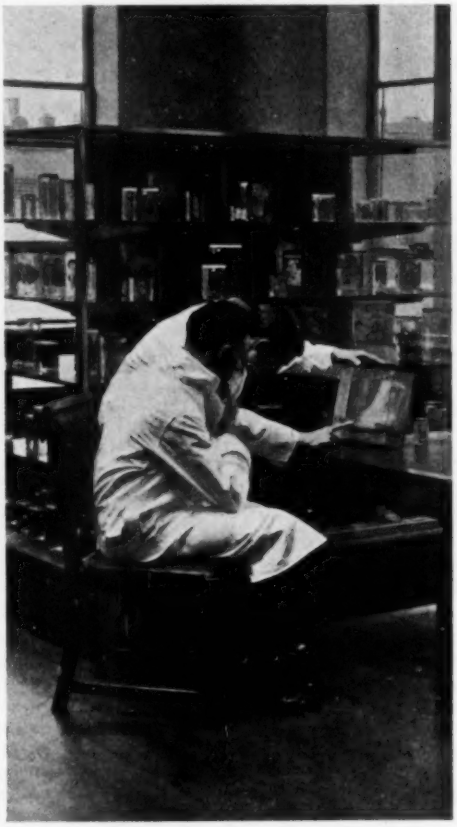

FIG. 11.—A corner of the museum on the first floor. The available space is limited and the museum will be strictly a teaching one.

will work in the laboratories under direction of members of the staff carrying out the ordinary pathological investigations for the hospital, and research students will be mainly occupied with their individual problems. Formal teaching will play little part in the scheme, but pathological conferences open to anyone who desires to attend will be held on one or two afternoons a week when the routine work of the department will be discussed by the staff and the students. Post-mortem demonstrations are now being held every day when opportunity

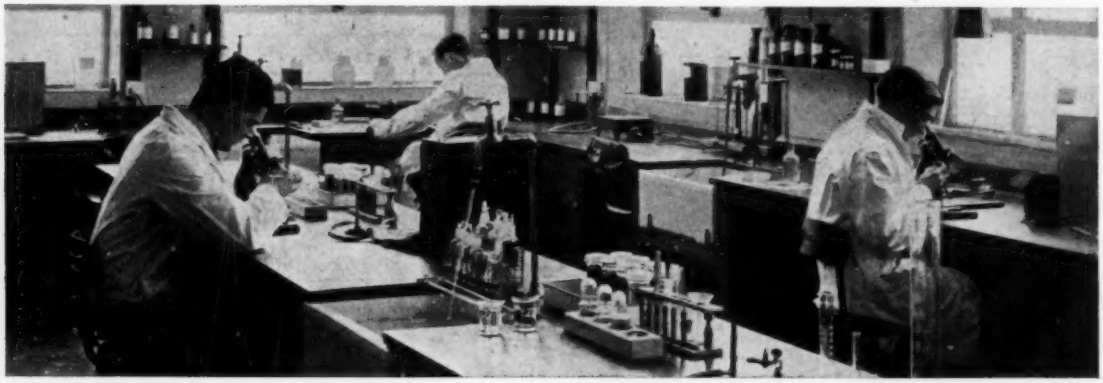

FIG. 10.—A histological laboratory adjoining the post-mortem room.

List of the Professorial Staff of the School

DEAN: Col. A. H. PROCTOR, D.S.O., I.M.S.

MEDICINE

PROFESSOR	F. R. FRASER, M.D. Edin., F.R.C.P. Lond.
Reader	R. S. Aitken, D.Phil., Oxon., M.B.N.Z., M.R.C.P. Lond.
Senior Assistant M.O.	Benjamin Barling, M.D., M.R.C.P.
First Assistants—	
General Medicine ..	G. H. Jennings, M.R.C.P. Lond.
Respiratory ..	J. G. Scadding, M.D., M.R.C.P.
Cardiovascular ..	P. H. Wood, M.B. Melb., M.R.C.P.
Immunities and Infections	C.H.Stuart Harris,M.D.,M.R.C.P.
House Physicians ..	R. G. B. Gilbert, M.B. Lond., N. V. Birrell, M.B. Glasg., D.P.H., T. R. C. Fraser, M.B. N.Z. R. F. Fairweather, M.B. St. And., E. C. Allibone, M.B. Leeds.

SURGERY

PROFESSOR	G. GREY TURNER, M.S. Durh., F.R.C.S. Eng., F.A.C.S.
Reader	Lambert Rogers, M.Sc. Wales, F.R.C.S., F.R.A.C.S., F.A.C.S.
Senior Assistant M.O.	A. Elliot-Smith, F.R.C.S. Eng.
First Assistants—	
Fractures and Orthopædics ..	A. J. Watson, M.B., M.R.C.P. Lond., F.R.C.S. Eng.
Genito-urinary ..	A. L. Light, M.S. Lond., F.R.C.S.
Casualty Officers ..	H. D. Clarke, M.B. Dub., I. H. Gosset, M.R.C.S., B.Ch. Oxon.
House Surgeons ..	M. T Greig, B.Sc., M.B. Otago, G.W.D. Reeves, M.R.C.S. Eng., Margaret P. Miller, M.B. St. And., Mahmud Hafezi, M.R.C.S. Eng.

OBSTETRICS AND GYNÆCOLOGY

PROFESSOR	JAMES YOUNG, D.S.O., M.D., F.R.C.S. Edin., F.C.O.G.
Reader	J. Chassar Moir, M.D., F.R.C.S. Edin., M.C.O.G.
Senior Assistant M.O.	A. D. Morris, M.D. Brux., M.B. Lond.
First Assistant ..	G. W. Theobald, M.D., M.R.C.P. Lond., F.R.C.S. Edin., F.C.O.G.
House Surgeons ..	M. A. Robertson, M.B. Camb., J. Ewing, M.B. Leeds.

PATHOLOGY

PROFESSOR	E. H. KETTLE, M.D., F.R.C.P. Lond.
Readers—	
Bacteriology ..	A. A. Miles, M.A. Camb., M.R.C.P.
Pathological Chemistry ..	Earl J. King, M.A., Ph.D. Canada.
Morbid Anatomy	John Gray, M.D. Edin.
Assistants—	
Clinical Pathology	Janet M. Vaughan, D.M. Oxon., M.R.C.P. Lond.
Bacteriology ..	P. H. Martin, B.M. Oxon., M.R.C.P. Lond., D.T.M. & H.
Pathological Chemistry ..	G. A. D. Haslewood, M.Sc. Oxon.
Morbid Anatomy	C. V. Harrison, B.Sc., M.B. Wales, M.B. Lond.

CONSULTING STAFF

Dermatology	Dr. R. T. Brain.
Orthopædics	Mr. E. Laming Evans.
Psychology	Dr. Aubrey Lewis.
Pediatrics	Dr. Alan Moncrieff.
Ophthalmology ..	Mr. R. C. Davenport.
Ear, Nose, and Throat	Mr. Sydney Scott.
Neurology	Dr. J. Purdon Martin.

offers at 1.30 P.M. These are open to everyone, and the professor of pathology will combine with the professor of medicine in a clinical pathological conference once a week. One of the other weekly conferences will be devoted to the post-mortems of the week in which cases will be dealt with from a more pathological point of view, and students will be able to enter more deeply into the bacteriology, chemical pathology, and biochemistry of the material.

It will now be obvious that pathology at the Hammersmith school is not to be regarded as a separate *Fach* or discipline but as a habit of mind pervading every aspect of medical inquiry.

MEDICINE AND THE LAW

Capacity of Injured Workman

IN Cunard Steamship Co. *v.* Moore the House of Lords not long ago refused to allow the Court of Appeal to overrule a county court judge on a point of medical evidence. It was a case of workmen's compensation. Moore, working on a ship, had his left arm caught in the rope of a derrick. Both bones of the left forearm and also two ribs on the left side were fractured. He was paid full compensation at the agreed rate of £1 6*s.* 4*d.* per week from the end of 1930 to Feb. 9th, 1933. Dr. X then certified that Moore had so far recovered as to be able to perform heavy work; his wrist movement would improve by doing work. Accordingly the employers gave notice under Section 12 of the Act and diminished the weekly payment to 10*s.* Moore asked for light work for five and a half days a week at an ordinary dock labourer's pay. This was refused. Subsequently he asked for arbitration, claiming compensation on the basis of total incapacity as from Feb. 25th, 1933. The Steamship Co. answered that in the month of February Moore was only partially incapacitated and had since entirely or almost entirely recovered. At the arbitration in the Liverpool county court Dr. Y, giving evidence on behalf of Moore, said the man could not do full work and no improvement was to be expected. Dr. X testified on the other hand that Moore's injuries would cause him discomfort but not incapacity for dock labour; he could now do full work and would improve and be all right in six months. The county court judge, accepting the evidence of Dr. X, found that Moore was, at the date of the hearing, fit for full work and that his incapacity had ceased. On appeal the Court of Appeal held that the evidence in the county court had shown that the capacity for work was not that of an ordinary healthy man and that there was no evidence that the incapacity had ceased. The Court of Appeal sent the case back to the county court for assessment of the amount of compensation payable. In January, 1934, an award of 10*s.* a week was made, to begin at June 16th, 1933, and to continue during the partial incapacity. The Cunard Co. accepted this award for four months and paid compensation thereunder; it then appealed to the House of Lords, where the order of the Court of Appeal was discharged and the county court judge's decision was restored. Lord Blanesburgh said that the true effect of the evidence given by Dr. X (that the incapacity had now ceased) was something which could be better appreciated by the county court judge who heard the evidence personally than by the appellate courts which did not hear it. There was evidence on which the county court judge could find that incapacity "from every relevant point of view" had ceased. It was of the first import-

ance, said Lord Blanesburgh, that the finality of an arbitrator's findings of fact in workmen's compensation cases should be jealously maintained.

Handwriting Experts

Of all species of expert witnesses the handwriting experts seem to be the most vulnerable. Defending advocates never spare an allusion to the Beck case and now the Binney case adds another arrow to their quiver. Binney was indicted at the Derbyshire assizes last July for having sent letters to a Mrs. Clift demanding money with menaces. Although the charge accused him of having "uttered" the letters and not of having written them himself, the prosecution ran its case on the basis that the handwriting was that of Binney. Convicted in July, he asked on August 15th for leave to appeal. There was no fresh evidence as a ground for disturbing the jury's verdict, and the Court of Criminal Appeal dismissed his application. On August 28th another letter of the same character reached Mrs. Clift. Binney then petitioned the Home Secretary. On March 5th and April 3rd two more such letters arrived and a few days ago, on the eve of the reconsideration of the case by the Court of Criminal Appeal at the instance of the Home Office, a fourth letter came. At the recent hearing there was expert evidence (apparently not disputed by the Crown) that these four post-conviction letters were written by the same hand as the letters on which Binney had been found guilty. An officer from Dartmoor Prison, where Binney was serving his sentence, said that was no record of anyone having visited the man in prison; there was further evidence that the letters could not have been sent from the prison. It was of course possible that Binney had written the four letters before his trial to be posted at intervals later; but the post-conviction letters dealt with events which happened while he was in prison and one letter actually named the precise term of sentence he had received. It was possible too that a confederate was working with him and was managing the post-conviction correspondence; but the jury at the assizes had convicted Binney on the basis of his having been the sole person concerned. "It is clearly established," said Lord Hewart, in delivering the judgment which has now set Binney at liberty, "from materials which were not open to any court in July, that there is a hand somewhere, other than the hand of Binney, which is responsible for the physical act of writing these letters." The court was obliged to conclude that, if the jurors had had these fresh materials before them, they would not have come to the conclusion that he was guilty of the charge.

The difficulty of the handwriting expert is that he has often to bear a disproportionate burden in supporting a case where other kinds of evidence are missing. It is for the jury to say what weight is to be attached to what he says. A jury can see similarities of script or spelling readily enough, but it is convenient that someone should point them out first. Sometimes the handwriting expert can make an overwhelming case with decisive effect. This happened on the prosecution of Bruno Hauptmann, the alleged kidnapper of the Lindbergh baby. A letter demanding a ransom was left in the child's nursery on the night of the crime; other letters were written in the course of extracting the 50,000 dollars which Colonel Lindbergh paid in vain; one letter concerned the production of a "token" of authenticity, namely, the garment which the child had been wearing. There were 14 of these "ransom notes" and 16 acknowledged specimens of Hauptmann's actual writing, such as his application for a motoring licence and certain specimens written by him at the dictation of the police. Particular letters, such as an uncrossed "t," and a peculiar "x" which resembled a double "e," were common to all the writings. Spelling mistakes made another connecting link—"note" for "not," "gut" for "good," "mony" for "money," "boad" for "boat," "hte" for "the," and so on. Another was the idiosyncrasy of hyphenating "New-York." All these points a jury could easily follow, and their cumulative effect would be strong. These and other matters (such as the tracing of the ransom money and the identification of wood in the kidnapper's ladder with wood taken from Hauptmann's house) are admirably presented in a recent account of the case (The Lindbergh Crime, by Sidney R. Whipple, 6s. net, Methuen). It is a thrilling story.

A Problem of Professional Secrecy

There is no end to the problems which can arise or can be invented in respect of professional etiquette. Life, unhappily, is not so simple that the questions can always be answered with an absolute "Yes" or "No." Here is a conundrum about the duty of secrecy. A doctor attends a woman of about 75 in excellent health. The patient has a son with expectations under his mother's marriage settlement. He stands to receive a certain sum from the estate and is anxious to raise money on his prospects. Naturally the amount of the advance which he can obtain from an insurance company or other lender will depend on the probable duration of his mother's life. His solicitor, who is arranging the transaction, asks the doctor to express an opinion how long the lady is likely to live. Is the doctor betraying professional confidence if he does so?

The first reflections that suggest themselves are mainly negative. If the patient herself gave the doctor permission to answer the solicitor's question, all would be well; but presumably the matter is too delicate for the son to mention to his mother, though this is the proper way to regularise matters. The son has every right to arrange the advance in his own interests but he is not his mother's agent in so doing; consequently, as a matter of strict technicality, he has no authority to put the question to his mother's doctor for his own commercial purposes—still less has the solicitor. Certainly it would seem improper for the doctor to furnish the solicitor with a formal opinion about the patient for a fee without the patient's consent; if there is doubt whether the doctor should divulge information, he had better not sell it. Yet in spite of the rigid rules of non-disclosure and the practitioner's instinctive desire to keep on the right side in a case of doubt, there are two other considerations which may seem to permit a reasonable latitude. First, there is never the same degree of secrecy where relatives or members of the same household are concerned. A father will obtain frank information from the doctor who examines his child; he is legally and morally responsible for his children's health. By analogy a mistress who calls in a doctor to attend a domestic servant will be told whatever is necessary in the interests of the patient's treatment. And family ties of affection and sympathy make it natural that a medical practitioner should be willing to discuss the health of a patient with other members of the patient's household. Nor is the commercial element entirely irrelevant. There may be a question of economy in the matter of terminating a servant's contract of service for illness or of sending a member of the household to hospital. In the case of the son in the problem, if he asked the question

"Well, doctor, how long do you think my mother is likely to live?" it is unlikely that the doctor would feel obliged by an iron-bound sense of etiquette to refuse a reply, though the reply might not be sufficiently formal for the purpose of the son's transactions with the solicitor. Secondly, it is to be remembered that the patient in our problem enjoys good health. There is thus the less to divulge. Certain legal cases and judicial dicta have indicated that the patient may have a right to sue a too loquacious doctor for damages. But neither as a matter of law nor as a matter of etiquette has a doctor done much harm if he replies "your mother enjoys excellent health and I know no reason why she should not be spared to you for many years yet." As a matter of commerce, of course, the answer is little help to anyone who wants to raise money on expectations maturing at the patient's death. Terms based on the normal expectation of life can hardly be improved for the reversioner unless the report of the patient's health is unfavourable.

These casuistical questions as to what Dr. A should do in a particular situation invite diffuse speculation. Such situations doubtless occur in real life and somehow Dr. A manages to meet them without sensational consequences.

PUBLIC HEALTH

Economic Depressions: 1862 and 1935

THE recent issue by the Ministry of Health of a report [1] on conditions in an area subject to prolonged unemployment makes it opportune to recall the last detailed medical report on such a subject, that presented by Dr. (later Sir George) Buchanan at the time of the distress in the cotton trade consequent upon the American Civil War.[2]

Arnold's "History of the Cotton Famine" passes under review the period from April, 1861, to July, 1863, and indicates its peak as occurring in 1862, in the early months of which year "gaunt distress was advancing with rapid strides." The general use of the term "cotton famine" is itself ominous, though the historian is careful to dissociate it from the extreme meaning of the similar term as applied to the potato famine of Ireland: "but no such sorrow, no such shame as this, lies at the door of the wealthiest of the English counties. Suffering there was, sad and enduring, but not such as this."

The distress struck suddenly a wide community unprovided with social services as we understand them to-day, and there were no resources save the rapid expansion of poor-law relief and public charity. The extent of the calamity and the measures of relief are set out in Arnold's History and in Dr. Buchanan's report. When Dr. Buchanan wrote, in December, 1862, it was estimated that of half a million cotton workers half were wholly unemployed, a third were working short-time, and only a sixth were in full work. It was further estimated that another half a million people were directly dependent upon the cotton operatives and so involved in the calamity. The scale of relief which was adopted varied as between different boards of guardians but at the time of the report the average income from all sources was taken as nearly 2*s.* per head per week, exclusive of clothing, bedding, and firing which might be supplied in addition. There was, however, a sliding scale of relief according to the number in family and on the 2*s.* basis this is indicated as being for one person 3*s.* 4*d.*, man and wife 6*s.*, man, wife, and one child 7*s.*, with an additional allowance of 1*s.* for each child, so that with six children the family relief was 12*s.*, considerably less than 2*s.* per head. It was further estimated that in a household of four the amount available for food was 1*s.* 5*d.* per head per week. The Manchester retail prices of certain articles of food are quoted in the report on a quantity regarded as the average a single person would be likely to purchase for a week's consumption. If we compare these prices with those given as the B.M.A. mean in Appendix C of the report of the Committee on Nutrition we have the following figures:—

	1862.	1933.
	s. d.	*s. d.*
Bread, 8 lb.	1 0	1 2
Potatoes, 5 lb.	3	3·7
Oatmeal, 2 lb.	4	5
Tea, 1 oz.	3	0·8
Sugar, ¼ lb.	2·5	1·125
Bacon, ¼ lb.	1·75	1·5
	2 2·25*d.*	2 2·125*d.*

The fall in the price of tea and sugar, important articles of consumption, is noticeable. On the other hand, rent was a much smaller item, the figure quoted being 1*s.* per week. When due allowance is made for variations in the value of money, it is obvious that the financial provision was on a lower scale than prevails to-day.

What was the reaction on health to these conditions? Dr. Buchanan's report is based on his own observations and those of thirty medical practitioners holding public appointments. There does not appear to have been any general increase in mortality: the average number of deaths from all causes for the years 1857-61 in the twelve unions visited is given as 8353, while the figure in 1862 was 7427. An examination of the Registrar-General's tables shows the annual rate of mortality per cent. in Lancashire over the years 1854 to 1863 to have been 2·701, 2·680, 2·464, 2·628, 2·719, 2·454, 2·371, 2·592, 2·560, 2·629. This aspect of the situation is dealt with at some length in Arnold's "History" where emphasis is laid on the lesser consumption of alcohol and the increased care of children due to the enforced attendance at home of their mothers. The following quotation is illustrative:

> It was well said by the sexton of one of the most important towns in Lancashire, when asked how it happened that his lugubrious trade was unusually inactive during the summer of this year, "Well, thae sees," he answered, "poverty seldom dees. There's far more kilt wi' o'er-heytin' an' o'er-drinkin' nor there is wi' bein' pinched,"—a truth which contains a moral lesson valuable to all classes.

This absence of an increased total death-rate is, however, countered by increased manifestations of morbidity in various directions which are considered by Dr. Buchanan under several headings of causation. He refers to loss of strength, colour, and flesh among the cotton-workers as a body; to the observations made that "the parents have lost their health much more generally than the children, and particularly that the mothers, who most of all starve themselves, have got pale and emaciated"; to a generally

[1] Report of an Inquiry into the Effects of Existing Economic Circumstances on the Health of the Community in the County Borough of Sunderland and Certain Districts of County Durham. Cmd. 4886. See THE LANCET, May 4th, 1935, p. 1058.

[2] Dr. Buchanan's report (Dec. 30th, 1862) on the Health of the Operatives as affected by the Prevailing Distress. Fifth Rep. Med. Officer of the Privy Council, 1862, Appendix V.

asthenic type of disease; to a hæmorrhagic tendency; to a high prevalence of bronchitis and pneumonia; to an unparalleled quantity of itch; to grave complications of measles and scarlatina; and to an outbreak of typhus in a severe form, in which the death-rate at Preston was 23 per cent. The conclusions of the report are as follows:—

1. That while actual death from starvation has been of the rarest occurrence, there is a peculiarly low state of health among the unemployed operatives of the cotton towns, showing itself particularly in the elder people, and predisposing to various diseases.

2. That scurvy and other evidences of a tendency to hæmorrhage have been seen with remarkable frequency.

3. That lung diseases of a sort to be induced and aggravated by exposure have been rife, even out of proportion to the cold of the season.

4. That epidemic measles and scarlatina have habitually exhibited peculiarities that in ordinary times are only met with in weakly constitutions. That true typhus fever has shown itself. That epidemic diarrhœa has been below the average, except in Preston, which is the town that has suffered most from typhus fever.

5. That disease from drunkenness and from neglect of children has been less common than in ordinary times.

The report recently issued by the Ministry of Health on the existing conditions in Sunderland and certain districts of Durham was reviewed in our columns on May 4th. It refers to a period of more prolonged distress, countered by more advanced measures of public health.

Pasteurising Plants

The consumption of pasteurised milk is rapidly extending and it becomes ever more important that the milk should be pasteurised properly so that the term "pasteurised milk" should really connote safety. For this reason Sir Weldon Dalrymple-Champneys was invited by the Ministry of Health to prepare a report on the supervision of milk pasteurising plants which has just been issued.[1] Sir Weldon has no doubt that pasteurisation carried out in such a way as to meet the requirements of the Milk (Special Designations) Order of 1923 renders milk safe. Milk can, however, be recontaminated with pathogenic organisms after pasteurisation and, unless the milk is heated so long as to impair its physical qualities, some spore-bearing organisms are apt to survive. For this reason pasteurised milk will ultimately go sour. But even efficient pasteurisation need not interfere with the preservation of the cream line which is so important a commercial requirement, for the depth of cream separating out on the top of the milk on standing is regarded by many sections of the public as an indication of quality. Sir Weldon says he has seen many pasteurised milks properly pasteurised in efficient plants which showed a cream line at least as good as the majority of raw milks. Failure to secure efficient pasteurisation arises chiefly from lack of knowledge how to construct, install, and use efficient apparatus, and the report is an endeavour to give in concise form the information needed by officers of a local authority for the efficient discharge of their duties in connexion with licensing and supervising such plants. Sections on bottle filling and bottle washing have been added, for inefficiency at these stages is a common cause of failure to attain the bacteriological standard for pasteurised milk laid down in the Order.

[1] Ministry of Health Reports on Public Health and Medical Subjects, No. 77. H.M. Stationery Office. Pp. 47. 1s. 3d.

Grit and Fumes in London Air

The London County Council is a jealous custodian of the amenities of the metropolis and no respecter of persons when these amenities are imperilled. The furnaces of the Stepney generating station in Limehouse have for 15 years past emitted smoke and grit of which the inhabitants have complained. An injunction was obtained against the borough council in June, 1920, and upheld on appeal when the court ruled that the nuisance was a real one, even taking into consideration the character of the neighbourhood. Two years ago complaints were again made and the L.C.C. chemist reported that one chimney-stack was discharging in 24 hours nearly 4 cwt. of grit containing 28 per cent. of unburnt matter. The Electricity Commissioners who were then consulted suggested the erection of a new chimney and the installation of dust extraction plant, measures which could be completed within 12 months. Although the twelvemonth is up it seems that nothing has been done to implement these measures, and temporary remedies have proved inadequate. The L.C.C. is now to press the Minister of Health for leave to take action against the Stepney council.

At the new Battersea power station the plant for eliminating sulphur fumes, smoke, and grit has fulfilled the expectation raised in the experimental stage, but in view of the second half of the station still to be erected the L.C.C. is unwilling to take any risk because the problem is a new one and a further improvement in the processes may reasonably be anticipated. The L.C.C. would like to see a Government committee set up to undertake research into the general question of the best means of removing sulphur compounds from flue gases. Representations to this effect are to be made to the Ministers of Transport and of Health.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED MAY 4TH, 1935

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 0; scarlet fever, 1905; diphtheria, 915; enteric fever, 11; acute pneumonia (primary or influenzal), 1182; puerperal fever, 47; puerperal pyrexia, 114; cerebro-spinal fever, 22; acute poliomyelitis, 3; acute polio-encephalitis, 1; encephalitis lethargica, 10; dysentery, 13; ophthalmia neonatorum, 103. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on May 10th was 3403, which included: Scarlet fever, 1040; diphtheria, 1368; measles, 29; whooping-cough, 387; puerperal fever, 27 mothers (plus 7 babies); encephalitis lethargica, 269; poliomyelitis, 3. At St. Margaret's Hospital there were 18 babies (plus 9 mothers) with ophthalmia neonatorum.

Deaths.—In 121 great towns, including London, there was no death from small-pox, 1 (1) from enteric fever, 31 (0) from measles, 7 (2) from scarlet fever, 33 (4) from whooping-cough, 39 (7) from diphtheria, 51 (16) from diarrhœa and enteritis under two years, and 125 (16) from influenza. The figures in parentheses are those for London itself.

Influenza is on the wane, but Liverpool reported 14 deaths, Manchester 9, Middlesbrough 7, Newcastle-on-Tyne 6, Salford 4, no other great town more than 3. Five fatal cases of measles were reported from Liverpool and from Wigan, 4 from Cardiff. Preston had 4 deaths from diphtheria.

The number of stillbirths notified during the week was 273 (corresponding to a rate of 36 per 1000 total births), including 40 in London.

PANEL AND CONTRACT PRACTICE

Employment of Assistants

THE medical benefit regulations lay it down that an insurance practitioner may not have included in his list more than 2500 insured persons (in some areas the maximum is determined by the local insurance committee at a lower figure) unless he is working in partnership, in which case any member of the partnership may accept up to a maximum of 3000 provided the average for the partnership does not exceed 2500. If an assistant is employed with the consent of the insurance committee the principal may accept further insured persons up to a maximum of 1500. Insurance committees in consenting to the employment of an assistant usually stipulate that the assistant shall have his name included in the Medical List, and while this is a useful precaution it sometimes leads to misunderstanding inasmuch as there is no obvious provision to prevent an assistant accepting insured persons in his own name. For various reasons, however, it is undesirable that he should do so, particularly as in many cases the assistant is merely waiting until he can secure a practice of his own—it is no longer correct to describe him as waiting for his beard to grow. Assistants consequently change quite often, and apart from the undesirability of frequent changes of doctor requiring to be notified to the patients, it is fundamental that the principal should be the responsible practitioner in relation to all the patients associated with the practice.

The regulations are silent as to the definition of an assistant, but clearly it is necessary that both practitioners and committees should have a definite understanding of what constitutes an assistant, especially when the assistant is engaged in order that the principal may exceed the normal limit of acceptances. Other things being equal it is a mathematical certainty that the practitioner with (say) 2550 insured persons will require less help than his neighbour with 3800. What then does satisfy the requirement to employ an assistant? In London the committee require that the principal shall have at all times the first call on the services of the assistant even if he is not employed full time. A practitioner with patients of his own cannot fulfil this condition, as his responsibility for his own patients must form the first call on his services.

In some areas there is a clause in the distribution scheme which provides that even if a practitioner's list temporarily exceeds the permitted maximum he shall not be paid in respect of the surplus, and as a logical outcome of this provision it is necessary to ascertain quarter by quarter that practitioners, who, owing to their having been given consent to employ an assistant, have an additional number of patients, have actually continued to employ their assistants. At a recent meeting of the London insurance committee it was reported that two practitioners with slightly over the permitted maximum for a practitioner working single-handed had been without assistants, in one case for a complete quarter, and in the other for about five weeks. In the former case the termination of the arrangement was deliberate and the remuneration of the practitioner was reduced accordingly, but in the other efforts to obtain a new assistant had been made without success, and in view of this fact and of the provision in Clause 6 (5) of the allocation scheme that a practitioner whose list is found to be in excess has a period of two months from the date on which the excess was discovered within which to take a partner or assistant, or to reduce his list to the appropriate figure, the committee decided that for the quarter in question payment should be made in accordance with the number of insured persons on the practitioner's list.

Prescribing

During 1934 prescriptions for insulin to the number of 31,357 were dispensed for insured persons in London at a total cost of £9392 16*s*. 11*d*.

Modern conditions of life are sometimes accused of causing digestive troubles. During the month of January 11,706 prescriptions for 40,904 apothecaries' ounces of non-proprietary compound bismuth powders were issued in London. The ingredient cost of a ton and a quarter of this preparation was £264 11*s*. 8*d*. Only eight prescriptions for proprietary brands were issued during the same period.

OBITUARY

SIR THOMAS STAFFORD, Bt., P.C., F.R.C.S.I.

LATE MEDICAL COMMISSIONER, LOCAL GOVERNMENT BOARD, IRELAND

THE death occurred on Saturday last, May 11th, of Sir Thomas Stafford, a prominent worker in the cause of public health in Ireland. Born in 1857, son of John Stafford of Portobello, a well-known Roscommon family, he received his medical training in Dublin and qualified in 1882 with the double diploma of the Irish Colleges. He entered practice in his native county as dispensary doctor at Boyle, but shortly afterwards obtained the position of medical inspector to the Local Government Board of Ireland. He took the D.P.H. of the Irish Colleges in 1898 and was admitted F.R.C.S.I. in 1899, having already been appointed a medical member of the board, a position which he held for many years. He became prominent in the great health campaign inaugurated by Lady Aberdeen, and his services when he became a medical commissioner of the board were conspicuous in the cause of public health. A courteous, sympathetic, and particularly able administrator, he gave every encouragement in his power to all movements for the improvement of the public health of the country, and of the professional status of the medical man in the poor-law service. In 1906 he was appointed C.B., in 1913 was created a baronet, and shortly after became a member of the Irish Privy Council. He was a D.L. for Co. Roscommon.

On his retirement from his official duties, Sir Thomas Stafford became a great supporter of outdoor sport, fishing, shooting, and especially racing, in connexion with which he was for a time a steward of the Irish Turf Club. His death occurred at Lord Headfort's house in Kells; he had been in bad health for some time previously. He married in 1890 Frances, only child of the late Colonel E. R. King-Harman; she predeceased him and his son Captain Cecil Stafford King-Harman succeeds to the baronetcy.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Rear-Admiral P. Pick to *Pembroke* for R.N. Hosp., Chatham, and as Medical Officer in Charge.

Surg. Rear-Admiral W. W. Keir, C.M.G., has retired at his own request on relinquishing the command of the R.N. Hospital at Haslar.

Surg. Rear-Admiral Keir was the senior officer of his rank on the active list and entered the Navy on Nov. 8th, 1898, and served with distinction in the war. In 1928–30 he was in charge of the naval hospital at Hong-Kong. Consequent on the vacancy thus occurring, Surg. Capt. F. J. Gowans, senior medical officer in the hospital-ship *Maine*, has been promoted to Surg. Rear-Admiral. He joined the Navy in November, 1903, and served as staff surgeon in the *Queen Mary*, *Challenger*, and *Albion*. From 1928 he was surgical specialist at Haslar Hospital and became Surg. Capt. in December, 1929.

Surg. Capt. F. J. Gowans, M.B., to rank of Surg. Rear-Admiral.

Surg. Comdrs. W. H. Murray to *President* for course; and M. B. Devane to *Keith*.

Surg. Lt.-Comdr. (D) T. E. Breveter to *Victory* for R.M. Infirmary, Eastney.

Surg. Lt.-Comdr. D. C. Drake to *Drake* for Plymouth Hospital.

Surg. Lt. D. G. Yendoll to *Pembroke* for R.N.B.

Surg. Lt. W. S. Davidson, short service engagement terminated.

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Comdr. W. F. W. Betenson to *St. Vincent*.

Surg. Lt. H. L. Hoffman promoted to Surg. Lt.-Comdr.

Surg. Lts. J. N. Matthews to *Nelson*; C. Seeley to *Curacoa*; and G. H. Sellers to *Tiverton*.

Proby. Surg. Sub.-Lt. P. H. K. Gray to *Rodney*.

ROYAL ARMY MEDICAL CORPS

Short Serv. Commissions.—B. d'Epinay Barclay to be Lt. (on prob.).

REGULAR ARMY RESERVE OF OFFICERS

Lt.-Col. P. Dwyer, M.C., having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

TERRITORIAL ARMY

Lt. E. F. S. Morrison to be Capt.

K. G. W. Saunders (late Offr. Cadet, Univ. of Lond. Contgt. (Med. Unit), Sen. Div., O.T.C.) to be Lt.

G. O. Gauld (late Offr. Cadet, Cambridge Univ. Contgt., Sen. Div., O.T.C.) to be Lt.

R. D. Forsyth (late Offr. Cadet, Glasgow Univ. Contgt., Sen. Div., O.T.C.), to be Lt.

ROYAL AIR FORCE

Flight Lt. J. S. Carslaw is granted a permanent commission in this rank.

Flight Lt. O. S. M. Williams to Air Armament School, Eastchurch.

INDIAN MEDICAL SERVICE

The undermentioned appts. have been made:—

A.D.M.S.—Col. R. E. U. Newman, O.B.E., M.C., M.B., Brit. Serv.

D.A.D.P.—Capt. A. T. H. Marsden, M.D., R.A.M.C.

Majs. to be Lt.-Cols.—A. H. Shaikh, R. M. Kharegat, and J. C. Pyper, O.B.E.

The appts. of the undermentioned officers are confirmed:—

Lts. (now Capts.).—B. F. B. Russell, R. L. H. Minchin, W. G. Kingston, J. Edis-Myers, R. de Soldenhoff, C. J. Hassett, R. R. Prosser, E. Parry, W. G. Kennedy, and P. I. Franks.

The undermentioned appts. are made:—

To be Lts. (Temp. Commns.).—Harbans L. Khosla, Nisar Mohammad Durrani, Suraj Prakash Wanchoo, Sharad Chandra Misra, and Shri Rameshwar.

The undermentioned officers have vacated appts.:—

A.D.M.S.—Col. G. A. D. Harvey, C.M.G., V.H.S., Brit. Serv.

D.A.D.P.—Maj. A. D. Loganadan, I.M.S.

COLONIAL MEDICAL SERVICE

Dr. N. J. Dias has been appointed Government medical officer, British Guiana, and Dr. T. A. Redhead and Dr. J. E. Ross medical officers, Grenada. Dr. J. R. Forde becomes senior medical officer, Gold Coast; Dr. J. H. Pottinger senior medical officer, Palestine; Dr. A. M. W. Rae senior medical officer, Gambia; Dr. C. F. Deutrom superintendent and quarantine medical officer, Mandapam, Ceylon; and Dr. S. T. Gunasekera deputy director of medical and sanitary services, Ceylon.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

VOLUNTARY HOSPITALS

Prof. J. M. Munro Kerr, president of the Royal Faculty of Physicians and Surgeons of Glasgow, in an address on hospital development delivered last week, said that sooner or later voluntary hospitals would be faced with the problem of paying their surgical and medical staffs. Medical men as well as many members of the general public felt that it would be very unfortunate if the voluntary hospitals ceased to exist as entities. Hospital development was in a state of evolution, and it was difficult to foretell how the position of the voluntary hospitals and those under the control of local authorities would be affected. It appeared to many people that the only way by which the identity of the voluntary hospitals can be preserved is an expansion of the paying block system. The Victoria Infirmary was an example of successful development along these lines, and the Glasgow Royal Infirmary was embarking on a similar scheme. This would have the effect of removing the less efficient nursing-homes of which there are a great number. It was now difficult for young men to specialise because hospital appointments are unpaid, and Prof. Kerr had heard recently of promising young specialists who had been obliged to give up on account of this difficulty. In some hospitals two-thirds of the running costs were paid by the paying block, and he believed that the large voluntary hospitals could in this way be made almost self-supporting, while the physicians and surgeons would be satisfied with the arrangement. For the past 10 or 15 years many medical men had been trying to impress upon directors of voluntary hospitals that this would be their salvation. If the developments they advised were carried out, he thought that the voluntary hospitals would be in such a strong position that there would be no danger of the local health authorities taking control of them.

HOURS OF ASYLUM STAFF

The Fife Joint Asylum committee last week decided to recommend that the hours of duty of the staff at Springfield Asylum should be reduced to 48 per week. The application for a reduction in hours was made by the Mental Hospital and Institutional Workers' Union, and the report submitted showed that the staff at present have a 12-hour day and a 60-hour week. The proposed alteration was supported by the medical superintendent. The recommendation will entail an additional cost of nearly £3500 per annum, and the nurses' home will have to be extended. The £65,000 hospital extension scheme at the asylum has been agreed to, and at a meeting of the committee on May 8th it was decided to obtain competitive plans for the work.

THE MEDICAL CURRICULUM

LINES OF REFORM

TO-DAY appears the report of a conference which has met from time to time since December, 1932, to consider defects in the medical curriculum and ways in which they may be overcome.* Its authors begin by pointing out that despite its imperfections the present curriculum is capable of producing well-trained and efficient practitioners of medicine. Their preponderance, however, depends on inherent qualities as much as on training. The more intelligent student is never likely to be handicapped by the faults of a curriculum so much as his less gifted brother or sister. But the intention should be to give the student of average ability such knowledge and such education as will enable him to approach the problems of practice with some degree of confidence and put him in a position to learn from subsequent observation and experience. A scientific outlook, once acquired, will prove of more lasting value than a store of knowledge; at the same time it is impossible to inculcate general scientific principles without the introduction of many facts.

The conference has felt unable to recommend changes which would prolong the present minimum period of five years for a medical qualification. It has aimed instead at changes which will make it a continuous period of study, as little broken up by examinations as possible, affording the student time and opportunity for self-education in spite of the efforts he is called upon to make in memorisation. It is hoped that under this régime his memory may prove equal to its burden, and that by developing at all points fields of association his mind may acquire that kind of culture which survives the forgetting of facts.

Pre-medical Studies

The conference found that its dislike for early specialisation was shared by the scholastic profession. That a boy who has reached matriculation standard should spend his last two years at school almost wholly in the study of the natural sciences may not be undesirable, although it is important that the study of literature and languages should be continued up to the time of leaving. But it is a serious matter if intending medical students during their last two years are segregated in a small group, not only from the rest of the school, but even from other boys on the science side. The existence of "M.B. classes" at schools—small groups of boys who are engaged, not so much in the study of science, as in working through a prescribed syllabus in preparation for a series of small examinations—is a very unfortunate result of the present system. If all schoolboys and girls devoted a reasonable proportion of their time throughout the school period to the natural sciences there should be less need for a prolonged period of intensive preparation at the end of school life.

As a practical suggestion the conference would allow and encourage exemption from the 1st M.B. examination by means of the higher school certificate taken in the three principal scientific subjects and a subsidiary non-scientific one. In view of the variation of syllabuses for pre-medical examinations a common syllabus is recommended, whose chief modifications are a reduction in the amount of botany and of inorganic chemistry with the inclusion of some rudiments of organic chemistry.

It is agreed that medical studies proper (i.e., anatomy and physiology) should not be begun before the age of eighteen.

Pre-clinical Period

No change is proposed in the present arrangement whereby the first two years of the medical curriculum are devoted to intermediate studies, leaving three years for the clinical period. It is believed, however, that rearrangements could be made so that the course would be more harmonious, consecutive, and interesting. To this end it is recommended that the work at this stage should be arranged by a board of teachers representing anatomy, physiology, chemistry, biochemistry, pharmacology, and pathology. A suggested scheme of studies is the following:—

FIRST YEAR.	SECOND YEAR.
First Term.	*Fourth Term.*
Anatomy and Histology.	Physiology and Biochemistry.
Organic and Physical Chemistry.	Anatomy and Neurology.
Second Term.	*Fifth Term.*
Anatomy, Histology, and Embryology.	Physiology and Biochemistry.
Organic and Physical Chemistry.	Applied Anatomy and Physiology.
Physiology and Biochemistry.	Pharmacology.
Third Term.	General Pathology.
Physiology and Biochemistry.	*Sixth Term.*
Anatomy, Histology, and Embryology.	Applied Anatomy and Physiology.
	General Pathology and Bacteriology.
	Pre-clinical Examination (normally in June).

While it is essential that the student should become acquainted with laboratory methods of scientific research, should himself make experimental observations, and should be trained to carry out accurate determinations as well as careful dissections, the relevancy of these requirements to his subsequent study of the living human body should not be allowed to escape his notice. The normal function of an organ can be described and observed in the course of physiological teaching, but it would form more permanent associations in the student's mind if variations from the normal could at the same time be demonstrated in the living human subject. Knowledge of the normal activities of the circulatory system observed in an animal or in normal man is amplified in a valuable way when compared with the results of a defect of the circulatory mechanism in man; the comparison not only reinforces memory and stimulates criticism but excites attention and interest. The demonstration of a hemiplegic patient will teach a student many facts about the physiology and anatomy of the pyramidal tract which cannot be learned in any other way. The conference holds that modifications in teaching anatomy and physiology along these lines would not only result in a better preparation for his later work but would make the curriculum appear less disjointed.

During the last two terms of the pre-clinical period the gap between the intermediate and clinical studies should be bridged by examples of the applications of physiology and anatomy to clinical medicine and surgery and by an introductory course illustrating

* The members are Sir FARQUHAR BUZZARD, Dr. M. H. MACKEITH, and Mr. W. H. OGILVIE (representing the University of Oxford); Sir WALTER LANGDON-BROWN, Prof. H. R. DEAN and Dr. A. E. CLARK-KENNEDY (University of Cambridge); Dr. A. M. H. GRAY, Prof. G. E. GASK, Prof. C. A. LOVATT EVANS, and Prof. WINIFRED CULLIS (University of London); Lord DAWSON OF PENN, Sir RAYMOND CRAWFURD, and Sir EWEN MACLEAN (Royal College of Physicians of London); Sir HOLBURT WARING, Prof. WILLIAM WRIGHT, and Mr. E. L. PEARCE GOULD (Royal College of Surgeons of England); Mr. T. B. LAYTON (Society of Apothecaries of London); and Prof. W. W. JAMESON (London School of Hygiene and Tropical Medicine). Lord Dawson has acted as chairman, and Mr. G. W. Rossetti as secretary, while Sir Farquhar Buzzard has presided over the executive committee consisting of Prof. Gask, Dr. Clark-Kennedy, Prof. Dean, Prof. Lovatt Evans, Mr. Pearce Gould, Dr. Gray, Dr. MacKeith, Sir Ewen Maclean, and Prof. Wright.

the principles of general pathology, immunology, and bacteriology. This proposal is made not with a view to initiating the student into the problems of clinical medicine but to enable him to appreciate the relevancy of his laboratory observations and experiments to the structure and function of the living human body. At this stage the student should begin to practise the use of the stethoscope, ophthalmoscope, and otoscope, and should gain experience of the relation of "physical signs" to the normal structure and function of the organs of the body.

Anatomy.—The conference has devoted earnest attention to the large proportion of the student's time which is spent in the dissecting room, and has considered a suggestion that it is unnecessary for every student to dissect the whole body. On this important question unanimity has not been reached. On the other hand, it takes the view that while dissection is valuable as a training in technique and a discipline, it can with advantage be supplemented by the use of models, by radiography, and by other methods. The teacher of anatomy could save the student's time if he had the opportunity of demonstrating the anatomy of the abdomen and thorax in the post-mortem room, and he should also be given access to hospital material for teaching applied anatomy, with or without the assistance of a clinician attached to his department.

In the past, it is felt, too much time has been spent and too great a stress has been laid on the memorisation of structural detail for examination purposes. It is therefore recommended that the student's acquaintance with the details of each part immediately after its dissection should be established orally by his teachers before he is allowed to proceed to the next, but the retention in his memory of all such minutiæ should not be made the criterion of his fitness to pass on to hospital work.

Histology.—The idea prevalent in some medical schools that the object of histology is "to spot the organ" by a hasty glance down the microscope should be discouraged. The conference is of opinion that the student should have a practical knowledge of the more important methods by which material is prepared for microscopical examination, but thinks there is a tendency to spend too much time in the practice of technical details. The teaching of morbid histology would be made somewhat easier if during the teaching of normal histology the attention of the student were drawn from time to time to specimens illustrating the changes resulting from the reaction of tissues to chemical and physical influences.

Organic and Physical Chemistry.—The growing importance of a knowledge of chemistry in physiology, pathology, and medicine is universally recognised. Not only organic chemistry but physical and colloidal chemistry are essential for the medical student, and further instruction in chemistry is clearly necessary after passing the 1st M.B. The conference holds that the teaching in this subject should be determined by conference in which the teachers of physiology, biochemistry, and chemistry meet together, due weight being given to the opinions of the teacher of physiology on the special needs of students of medicine. A special examination in organic chemistry is unnecessary, but questions in organic and physical chemistry should be included in the pre-clinical examination in physiology and biochemistry.

Physiology.—It is now an increasing and commendable practice in medical schools to lay stress on the physiology of man. The significance of these lessons, however, is often not realised and the medical student fails to recognise their import when he is faced with their clinical applications. It is at this stage that coöperation with the clinical staff may prove essential. The object to be aimed at is that the head of the physiology department should have access to patients or command the services of some member of the clinical staff to give appropriate demonstrations. It should be made clear that the student at this stage is not in this way to receive instruction in medicine but in physiology. He should be shown patients, not as examples of disease, however typical, but as examples of deranged function, such as jaundice, œdema, cyanosis, breathlessness, or paralysis.

Pharmacology.—A knowledge of the physiological action of drugs is of primary importance to the student, and the conference believes that a short course of lectures and practical work on this subject is essential. While there should be no separate examination the candidate's knowledge should be tested either by the inclusion of pharmacological questions in the physiology paper and in the practical examination or by a viva-voce examination. A knowledge of doses should not be required from a student before he begins his clinical work, and in the pre-clinical teaching of pharmacology the therapeutic applications should be omitted except in so far as they are necessary to illustrate important principles.

Pathology.—As already indicated, the student should be introduced to the elements of general pathology, immunology, and bacteriology during the last two terms of the pre-clinical period. The object of this is to bring home to him the basic processes underlying the disorders of structure and function with which he is shortly to be faced at the bedside. The scope of this instruction should, of course, be a matter of agreement between the pathologist and physiologist, whose fields might otherwise overlap.

Psychology.—A course of about eight lectures introductory to the psychological aspects of medicine should be given during the last two terms of the second year. Attendance should be obligatory, but no examination should be held at this stage.

THE PRE-CLINICAL EXAMINATION

The pre-clinical examination at the end of the second year of the curriculum should test the student's general knowledge of the structures and functions of the human body and his acquaintance with the principles underlying simple reactions of its tissues to chemical and physical changes in their environment. The conference has been impressed by the high proportion of failures in examinations in anatomy and physiology, and believes that their number could and should be reduced, not by lowering the standard but by altering the methods of teaching and examination. Knowledge of detail should be tested orally by the teacher before passing on to a new part of the work, and success in the pre-clinical examination should depend not on a mere feat of memory but rather on such grasp of the structure and function of the body as is a necessary equipment for hospital work. Since instruction in elementary general pathology is to be included in the pre-clinical period the student's knowledge of this subject should be tested in the examination. The board of examiners should represent anatomy, physiology, pathology, and pharmacology, and they should meet and coöperate in setting their questions.

Clinical Period

The supreme value of periods of clerking and dressing in the general wards remains unchallenged. It must be recognised, however, that medicine is becoming, and should become, more scientific and less empiric. The scientific standards and methods of thought inculcated in the pre-clinical years should be carried into the wards and applied at the bedside and in the laboratory. For this reason it is hoped that applied physiology and anatomy will be carried through the whole of the medical course, and also that pathology will be taught throughout the clinical period, in close association with all the branches of medicine, and not be regarded as a special study.

There is in all large hospitals a mass of clinical material ready to hand for the study of minor ailments and much of this passes in and out of the casualty and out-patient departments unused. In special departments such as those dealing with the diseases of the eye, the ear, the nose, the throat, and the skin, the student may, under proper guidance, absorb a large amount of useful information and experience if he is encouraged to do so. But he knows that there is little likelihood of his being confronted with an "eye case" or a "throat case" in his final examination and is often content to run the risk of exposing his ignorance in these directions. The remedy appears to lie in having representatives of the special departments on the board of examiners, and the fear of their expecting too much specialised knowledge from students need not be entertained if they examine in association with general physicians and surgeons. On the other hand, their coöperation would lead to the newly qualified practitioner being more familiar with the use of instruments, such as the ophthalmoscope and the laryngoscope, and with common disorders of the sense organs which will form a big part of his work in general practice. Much of the time now spent in watching major operations might be more profitably used in attending the casualty department.

The teaching of *preventive medicine* will be adequate only if its importance is realised by teachers throughout the whole curriculum. The professor of physiology will demonstrate the scientific basis of personal hygiene; the teacher of pathology will emphasise the advances which have come from bacteriological and immunological research; the clinician will find innumerable opportunities for instruction in preventive medicine; while obstetricians and pædiatricians must explain the practitioner's functions in relation to such matters as antenatal work, the conservative conduct of labour, the management of the puerperium, and the care of the child in its early years. In addition a short course in public health and State medicine, including forensic medicine, should be given, mainly by a member of the public health service selected for his ability to teach. (The syllabus of such a course is outlined.) It is suggested that some of the lectures might be given by an experienced insurance practitioner, and some by a man skilled in medico-legal work.

Medical psychology has already been introduced to the student. Now, during the clinical years, he must become familiar with the psychological aspects of patients in the hospital, and with this object demonstrations should be held at least once a fortnight throughout the period of in-patient clerking and in-patient dressing. In every ward there are many patients suitable for teaching of this kind, and in some schools such demonstrations have long been in force with great success. The physician or surgeon in charge of the ward may undertake them himself or may hand over that duty to a colleague attached to the hospital for the purpose of teaching medical psychology. In this way the teacher of medical psychology may be able to draw upon the material in the hospital as a whole for teaching purposes, and by selecting patients whose condition is not primarily one of mental disorder he can bring the psychological features of illness to the student's notice. Besides such instruction attendance should be required at not less than six demonstrations at a mental hospital, where the student can observe the general aspects of advanced insanity, and the working of an institution for the care of the insane and mentally defective.

In the final qualifying examination adequate knowledge of the psychological aspects of ill-health should be expected from the candidates and should be thoroughly tested, not only in written papers but in the clinical and oral parts of the examination.

Pathology must be taught with two objects in mind. First, to give the student such a grasp of its importance that he will come to think at the bedside instinctively in terms of pathology, and, secondly, to give him such an interest in the science of pathology that he is alert to follow its progress and ready to avail himself throughout his career of the advances in pathological theory and their application. To ensure the latter the student must attend set courses in pure pathology and spend enough time in laboratory work to learn something of its technique and experimental methods. To provide for the former he must throughout his clinical course renew his acquaintance with morbid processes as they are associated with physical signs. The conference is of opinion that the student will be helped to grasp the true importance of pathology and its bearing upon his practice if the examination in this subject —instead of being something separate, which can be passed and left behind—is made part of the final examination.

FINAL EXAMINATION

There is much to be said for a final examination in pathology, medicine, surgery, and obstetrics, the whole to be passed at one time. But experience has shown that few students are able to do themselves justice in so stern a test; and while it is very desirable to preserve the unity of pathology, medicine, and surgery by combining them in one examination, it is felt that obstetrics, gynæcology, and disorders of infancy might well be taken separately. Modern conditions of practice make the recently qualified practitioner a consultant in obstetrics, and for this reason it would in fact be a real advantage if the test of knowledge in this subject were made the last step in the whole curriculum. And to a certain extent the same may be said of public health and State medicine.

The conference therefore recommends that the final examination should consist of two parts:—

I. Medicine, Surgery, and Pathology.

II. Gynæcology, Obstetrics, and Pædiatrics; Public Health and State Medicine, including Forensic Medicine.

Both parts may be taken at the same time, or a candidate may enter for Part I. alone; but no one will be held to have passed Part II. until he has passed Part I. The examination will include a test of the student's knowledge of the physiological and therapeutic aspects of pharmacology (including toxicology).

The final examination, it is suggested, should be

conducted by a board of examiners who are to meet and coöperate in setting questions so that the papers are reasonably balanced. The pass list should be prepared at a meeting of the board at which all are present. The examiners in Part I. might include representatives of: medicine, surgery, pathology, medical psychology, dermatology, ophthalmology, oto-rhino-laryngology, and orthopædic surgery (including manipulative surgery); and in Part II.: obstetrics and gynæcology, pædiatrics and disorders of infancy, and public health and State medicine (including forensic medicine). The conference is agreed that such a board would secure a better all-round education for the medical student, by a more thorough test of his knowledge of general medicine and surgery, without in any way adding to its difficulties. And incidentally it recommends that more time should be allowed for the clinical and viva-voce parts of the examination than is usually given at present.

Post-graduate Clinical Experience

The conference holds that a medical student after passing the final examination should spend at least six months as a resident medical officer in an approved hospital before entering on private practice. It hopes that in the near future the number of such posts available to recently qualified men and women may be sufficient to make a statutory obligation of this kind practicable.

CORRESPONDENCE

SERUM IN STREPTOCOCCAL FEVERS

To the Editor of THE LANCET

SIR,—For some years I have been advocating a much more cautious and conservative attitude with regard to the use of serum in streptococcal fevers. It was therefore with interest and approval that I read the important paper by Dr. Leonard Colebrook in the current issue of THE LANCET and your own commentary upon it. In the Guy's Hospital Reports (1931, lxxxi., 1) I wrote a paper with Dr. R. E. Smith on the Natural History, Prognosis, and Treatment of Streptococcal Fever, in which we came to the same conclusions as Dr. Colebrook, (*a*) on analysis of my own experience in hospital and private practice and during the war, and (*b*) on analysis of the cases of streptococcal septicæmia treated in Guy's Hospital over a period of ten years. The prolonged and indiscriminate employment of serum without checks or controls and without any sound proofs of efficacy ever being produced is only another example of the unsatisfactory and unscientific tendencies in the therapeutics of the last few decades.

The older physicians frequently preferred to study and learn the natural course of a disease before making claims on behalf of new remedies. We should to-day make much more steady progress if we would but take a lesson from them. The example of Gull in my own school who was at pains to report on a series of cases of rheumatic fever "treated with mint water" as an answer to those who made extravagant claims for their "cures" might well be more frequently followed. It is surely a reflection on our methods that we have continued for forty years to employ expensive preparations, capable of producing unpleasant symptoms and even of causing adverse effects at times, on the basis of entirely haphazard and uncorrelated clinical trials and without any collective investigation. It has been the same story with vaccine and endocrine therapy.

I am, Sir, yours faithfully,

London, W., May 11th. JOHN A. RYLE.

THE PROBLEM OF DIPHTHERIA

To the Editor of THE LANCET

SIR,—All the points which Dr. Stallybrass has raised in his letters to THE LANCET of March 23rd and May 4th have been covered to the best of my ability in the criticised report itself and my letter in THE LANCET of April 13th. For example: (1) The extra invasiveness of *gravis* diphtheria bacilli is considered on page 37 of the report and in my last letter. (2) The weakness of the statistics which Dr. Stallybrass objects to is admitted in the letter and discussed on page 39 of the report. (3) The ratio of virulent to avirulent carriers, and the possible effect of immunisation on this ratio, is given on pages 45, 46, and 102. (4) The relative risk to the herd and individual of contracting diphtheria from cases and carriers is argued on page 100 of the report. Dr. Stallybrass is incorrect in stating that we used chocolate media to isolate diphtheria bacilli after immunising the school. This medium was only used to confirm the Leeds workers' observations; plain serum-agar was preferred by us and used both before and after the immunisation of Greenwich Hospital School in 1928.

I would not have trespassed further on your space, but on behalf of my colleagues I felt it only fair to try to correct the impression which is conveyed by Dr. Stallybrass's letters—to wit that the report contained irresponsible statements, which were made without full examination of the evidence which was available at the time it was produced. I feel horrified to think that anyone who took the trouble to read the *whole* report could imagine that the investigations in Greenwich Hospital School "constituted a crucial experiment." Almost ad nauseam the report was interspersed with cautions and examples against accepting the findings at this school as of general application everywhere else; for instances, among many others, see pages 46, 92, 100, and 127 of the report. I have ever distrusted "crucial experiments," especially in epidemiology, and as M. Greenwood has said, in better language than is at my command, of the type of reasoning which maintains that what happens in one environment will necessarily take place in another—"I do not know an uglier or more crippling fault in the statistical epidemiologist than to reason in such a way. It is almost, perhaps quite, as intellectually vicious as the *post hoc ergo propter hoc* of the unstatistically minded." In any case, should I have been guilty of this "crippling fault," Dr. Stallybrass is alongside me in the same boat, if he believes that the failure to discover a carrier among a "considerable number" of 200–300 children in one school sufficient justification for the inference that active immunisation will in general diminish carrier infection.

Finally, it is most interesting to learn that virulent carriers were probably as frequent among the Schick susceptibles as among the Schick immunes of a Liverpool institution, as this is another nail in the coffin of the dictum that the carrier of virulent diphtheria bacilli is always Schick negative—the

dictum on which, as I stated in my letter of April 13th, the inference that active immunisation may increase the virulent carrier-rate largely depends. As Dr. Stallybrass says, on most points he and I are in complete agreement, but on the point in question we are probably both subconsciously biased and perhaps, therefore, both at fault. Of course, if so, our conscious mind would be unable to realise this, and hence we had better agree to differ as regards the effect of anti-diphtheria innoculations on the virulent carrier-rate. I am, Sir, yours faithfully,

SHELDON F. DUDLEY.

Medical Department, Admiralty, S.W., May 13th.

CONTINUOUS DRIP BLOOD TRANSFUSION

To the Editor of THE LANCET

SIR,—Dr. Garnett Sheldon expresses his hearty agreement with the open method of approach to the vein. While not disputing the possibility that this may be necessary in the continuous method described (of which I have no experience), I cannot but feel that this must be regarded as one of its most serious disadvantages. Many of the cases so treated must necessarily be in a position of needing a repetition of the operation, especially if it is to be of service in cases of severe aplastic anæmia. To deprive such a patient of his available veins one by one is the worst sort of policy. I have seen such patients rendered almost untransfusable by the process, and, until there is some evidence of permanent benefit from the continuous method, the "direct approach" should surely be discouraged.

Personally I can see no reason why an ordinary venepuncture needle should not be used—the more so as a rapid flow is not required—and I cannot agree that it is necessary to be an "expert" to insert one, even where the veins are small. In ordinary transfusions, at least, cutting down on the vein should be an emergency proceeding only. The Red Cross Society has wisely placed a ban on "direct approach" in the case of donors, and I cannot help feeling that persons unable to carry out a venipuncture should not be encouraged to attempt transfusions at all. I am, Sir, yours faithfully,

Grosvenor-street, W., May 8th. J. W. SHACKLE.

DISTRESS AND HEALTH

To the Editor of THE LANCET

SIR,—The annotation in your last issue hardly does justice to the White Paper Cmd. 4886. The investigators spent only 17 days on the inquiry. In this time they went to eight places, visited maternity and child welfare centres, schools, junior instruction centres, and homes of the people. They consulted eight categories of medical, educational, and social authorities, including 28 medical practitioners and 7 members of the staffs of voluntary hospitals. They examined over 700 toddlers, 935 school-children, 400 youths and girls at junior instruction centres, 159 women at antenatal clinics, 230 mothers of young children, and observed men attending a labour exchange. Few will dispute that their observations are based "not on exhaustive clinical examination," and that their conclusions should "be regarded as approximate rather than as of scientific accuracy;" few also will attach much significance to their findings.

The vital statistics of the area concerned, which the investigators quote, show a serious condition during the last five years, however much worse it may have been in the past. The infant mortality-rates of the areas given are some 30 per cent. above that of England and Wales. The death rates in Sunderland from bronchitis, pneumonia, and measles were 30, 70, and 300 per cent. respectively above those of England and Wales. The pulmonary tuberculosis death-rate in Sunderland for the age-group 15–24 years in the period 1931–33 was about 50 per cent. higher than in the period 1911–13. A similar increase has occurred in other areas where unemployment has been severe and prolonged, while during the same time the pulmonary tuberculosis death-rate of this age-group in England and Wales generally has fallen 20 per cent. for males and remained stationary for females.

To return to the clinical examination; the investigators learnt that no gross rickets was found among regular attenders at welfare centres. Had they prolonged their trip a few days they might have discovered another profound truth—that people who visit a dentist regularly rarely have neglected teeth. With the widespread knowledge of the treatment of rickets and the increased facilities available, few children are left to become badly deformed; but this does not exclude the occurrence of milder degrees of the disease, which are only detectable by thorough examination. What significance, then, can be attached either to the percentage of rickets detected in toddlers by the investigators' superficial examination, or to the incidence of "deformities due to rickets" among school-children? Numerous statements have been made to the effect that mild degrees of rickets are still very common. For example, the medical officer of health for Woolwich (not a poor or unhealthy borough) claimed that 30 per cent. of children attending the toddlers' clinic in 1933 were definitely rachitic. Dr. A. G. Hamilton, writing in THE LANCET on Feb. 2nd of this year, considered that rickets could be detected in not less than 50 per cent. of those who attend infant welfare centres. If these claims are correct they reveal a widespread incidence of a wholly preventable disease. The matter calls for investigation by the Ministry of Health. But such an investigation would involve something more than a 17-day campaign, and a cheap, if hollow, victory.

I am, Sir, yours faithfully,

Bishops Stortford, May 11th. JOHN MARRACK.

EFFECTS OF PITUITARY EXTRACTS ON BLOOD

To the Editor of THE LANCET

SIR,—In their stimulating contribution to your last issue (p. 1099) Prof. Dodds and his co-workers describe the remarkable effects of extracts of the posterior lobe of the pituitary on the blood of rabbits. It may be of additional interest to record the fact that alkaline extracts of the *anterior* pituitary also exercise a profound influence on hæmopoiesis in rabbits. Animals injected with such extracts over a period of a week or ten days invariably exhibit a marked hyperplasia of the bone-marrow at autopsy. Since this hyperplasia is somewhat similar in nature to that produced by thyroid medication, it would appear that in this instance the phenomenon is due to stimulation of the thyroid gland by the thyrotropic principle of the pituitary.

I am, Sir, yours faithfully,

Brentwood, May 14th. THOMAS D. POWER.

DR. STILL'S PRESENTATION PORTRAIT

To the Editor of THE LANCET

SIR,—Will you please allow me to say that the note in the Royal Academy catalogue in reference to Dr. Still's portrait is not intended to convey that it will hang in King's College Hospital. It is to be presented to Dr. Still, together with a list of subscribers to the fund, which is being kept open for a short time longer. All contributions, through the generosity of Mr. Gerald Kelly, R.A., the artist, are being devoted to the endowment of a cot in honour of Dr. Still. Contributions may still be addressed to the Treasurer of the Portrait Fund at this Hospital, and a list of subscribers will be presented to Dr. Still in due course.—I am, Sir, yours faithfully,

C. E. A. BEDWELL,
House Governor, King's College Hospital.

Denmark Hill, S.E., May 14th.

PREVENTION OF THE COMMON COLD

To the Editor of THE LANCET

SIR,—In your issue of April 13th (page 914) Dr. Ernest Ward says that there are a host of prophylactic measures, none of which can be relied upon for protection against the common cold. Has he ever tried thyroid for this purpose? I have never given thyroid simply for the prevention of colds, but its action in this respect has been observed when given for other purposes. The dosage has been calculated according to the pulse-rate, sometimes assisted by the patient's temperature. I was taking 2 grains a day and noticed that although I was attending patients with influenza (to which I have always been very susceptible) I have remained free from that complaint through several epidemics. Also I suffered from no severe cold during the winter—a most unusual occurrence. A man, aged 28, taking thyroid gr. ½ every day, suffered no severe cold all the winter—he usually has several feverish chills; he stated that a chronic nasal catarrh from which he suffers has greatly improved. A lady, aged 46, taking thyroid gr. 1 every night volunteered the statement that she had suffered much less from colds all the winter. A man, aged 48, taking grs. 2 of thyroid regularly has not called me in to attend him once during last winter; previously he has usually been incapacitated from his duties for about 10 days once or twice every winter with a catarrhal cold. And I could go on telling stories like this.

I am, Sir, yours faithfully,

May 13th. A LONDON G.P.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS

Unemployment Assistance: Local Authorities Grants

ON May 9th in the House of Commons Sir HILTON YOUNG, Minister of Health, moved the second reading of the Unemployment Assistance (Temporary Provisions) (No. 2) Bill. The proposal was to put local authorities as far as possible in the same position after March 1st as they would have been if March 1st had been retained as the appointed day under the Unemployment Act of 1934. In order to do that they must clearly estimate the local authorities' expenditure on the relief of the class in question, and they must ascertain what contribution they would have made to the board under the financial scheme of the original Bill. In order to safeguard the local authorities the Bill provided that the duration of the agreed basis was to be either until the second appointed day was actually determined or for a limited period of six months. The amount of expenditure of which local authorities were being relieved was £6,000,000 a year, while the amount of their contributions was only £2,000,000 a year, so that there was a positive benefit to the local authorities on this transaction of no less than £4,000,000 a year. Liverpool would get assistance equivalent to a 2*s.* 7½*d.* rate; Sunderland a 2*s.* rate; Merthyr Tydvil a 2*s.* 9*d* rate; and taking the country as a whole the equivalent of a 3½*d.* rate was the average assistance to all local authorities.—Mr. A. GREENWOOD moved the rejection of the Bill on the ground that it failed to give effect to the principle that the entire cost of maintaining unemployed persons who are not in receipt of unemployment benefit should be a national charge.—The motion for the rejection of the Bill was negatived by 152 votes to 49, and the Bill was read a second time.

Public Health Services in India

In the House of Commons on May 13th the Government of India Bill was further considered in Committee. Mr. H. WILLIAMS moved to omit public health and sanitation from the list of subjects to be dealt with by the provincial legislatures. After discussion this amendment was negatived by 216 votes to 31.

Voluntary Hospitals and Paying Patients

In the House of Lords on May 14th the Voluntary Hospitals (Paying Patients) Bill was considered in Committee.

Viscount GAGE (Lord-in-Waiting) explained that on the second reading the Government had expressed general sympathy with the objects of the Bill, but they felt that in granting new powers in an Act there ought to be careful provision that the original intentions of existing trusts were preserved. The Government felt that the safeguards in the Bill could and should be strengthened. They had been in close touch with representatives of the hospitals in all matters concerning amendments and, except in one particular, there had been agreement.

Lord MACMILLAN moved to amend paragraph (2) of Clause 2 (accommodation for and charges to paying patients) so that it would read that the committee of management might charge such patients for accommodation, treatment, and maintenance (including such medical and surgical attendance and treatment as was given by the resident staff of the hospital) in accordance with such scale of charges as might be specified in any order made by the Charity Commissioners. He said that the amendment was designed to meet the wishes of certain medical associations. It was felt that provision should be made for a tariff which would cover all the expenses incurred by the hospitals. The amendment had been moved, after consultation with the British Medical Association, to remove any ambiguity with regard to fees to be charged.

The amendment was agreed to.

Viscount GAGE moved a new clause making provision for patients able to make some but not full payment. He said that if such patients were admitted to the free wards of certain hospitals it was doubtful whether that could be done legally, and it could not be done under certain trusts. It was obviously desirable that the hospital accommodation should be available to such persons. The clause made it obligatory on the Charity Commissioners, unless they thought it would be unappropriate in the case of a particular hospital, to reserve a certain amount of accommodation for such persons. The amount to be reserved would vary with different

hospitals. The scale of charges specified in an order would include charges fixed with a view to meeting the needs of patients who, though able to make some payment, were unable to pay charges sufficient to meet the full expense to the hospital.

The Earl of DUDLEY said that while he agreed with the necessity for the new clause he hoped that the Government realised that the cheaper beds, for instance the four-guinea beds for which Lord Gage was seeking to make ample provision, were largely carried by the more expensive or ten-guinea beds. If the Charity Commissioners restricted the number of the more expensive beds it would be impossible to maintain the four-guinea beds, and the hospitals would be driven to adopt a one-standard seven-guinea bed. He hoped it would be made quite plain that there was no intention to restrict the more expensive beds.

The clause was read a second time and added to the Bill.

Viscount GAGE moved a new clause containing provisions for the protection of existing trusts. He said that the first part of the clause which was agreed between the Government and the promoters indicated the conditions under which the Charity Commissioners might make an order allowing land belonging to hospitals to be used for erecting new wards or buildings for paying patients. It was provided that the use of the land was only to be authorised if the Commissioners were satisfied that it would not be required for the purposes for which the trusts were created until after the expiration of a substantial period. The second part of the clause was the only point on which the Government and the promoters had not been able to come to an agreement. As he understood it, the promoters thought that in certain cases it might be possible by rearrangement of the wards and minor structural alterations to provide extra accommodation within existing buildings for paying patients. They were quite ready to give safeguards to protect whatever number of poor patients' beds they might happen to have and to see that none of those poor patients should suffer in regard to space or treatment through this rearrangement. But they claimed that, providing no reduction of numbers was occasioned, they had the right to use the new accommodation for paying beds. The Government claimed that if by the rearrangement of certain buildings it was possible to provide additional beds the poorer class of patient had the right under most of the trusts to those extra beds, if the funds permitted. If any other form of wards could be devised to get over the difficulty the Government would consider it very carefully.

Lord MACMILLAN said he shared Lord Gage's satisfaction at the large measure of agreement which had been achieved in carrying through this very beneficial measure. He regretted that they were not entirely agreed. In regard to existing buildings, the clause was not really satisfactory. In many hospitals it would be possible by an internal arrangement at a relatively small expenditure to get additional space to accommodate a limited number of patients to whom charges could be made. It would not be possible to do that under the clause unless the hospital could show that it was short of funds, or that there was a shortage in demand for accommodation. Either or both of those things might be very difficult to prove in many instances.

Viscount HAILSHAM (Secretary of State for War) said that the Government agreed that where there were in existing buildings beds, these could not be diverted to other uses unless the conditions of the Bill were satisfied. Lord Macmillan and Lord Luke, however, wanted the Bill to allow the Charity Commissioners to say that where there were existing buildings, which had been erected by money provided for the express purpose of giving free medical or surgical help to the poor, these might be adapted to hold more beds than at present, and that the surplus beds might then be used for paying patients, notwithstanding the fact that there was money available to the hospital to use them as free beds and that there were poor people unable to pay anything who would like to avail themselves of those free beds. Those responsible for advising the Government took the view that where buildings had been provided for the very poor people who could pay nothing, and where there were very poor people who needed the help of the hospital and there was no room for them at present, if it were possible by arrangement of the existing building to provide extra accommodation, that accommodation was earmarked and devoted for the purpose for which the buildings were erected—the purpose of providing free help to the poor. Lord Macmillan, on the other hand, contended that if the rearrangement was achieved by money obtained from outside sources, then the extra accommodation so provided might be used for patients against whom a charge was to be made. This was a matter of principle and the Government did not feel it would be right to allow the extra beds in the existing buildings which were provided for the very poor to be used for any other purpose.

Lord LUKE said he hoped that before the Report stage the Government might find some form of wards which would meet the difficulty.

Viscount HAILSHAM said if the clause were allowed to pass in its present form the noble lord would not be prejudiced in any discussion which might take place between him and the Government on the matter.

The clause was agreed to, as was also an amendment by Lord Luke to the effect that the Bill should not apply to Scotland.

The Committee stage of the Bill was concluded.

HOUSE OF COMMONS

WEDNESDAY, MAY 8TH

Treatment of Disabled Pensioners

Mr. GUY asked the Minister of Pensions what was the future policy of his department with regard to the treatment of disabled pensioners; and whether it was intended that the existing hospital organisation would be continued permanently in its present form.—Major TRYON replied: It is the policy of the Ministry of Pensions to continue the existing practice of utilising those hospitals most suited to the interests of ex-Service patients for whom the Ministry is responsible. There is no intention of curtailing the special facilities provided by the Ministry except in so far as may prove to be justified by the natural decline in the medical work of the department.

Mansion House as Convalescent Home

Mr. LEONARD asked the Secretary of State for Scotland if he would give particulars of the large mansion house on the island of Raasay owned by the Department of Agriculture; how many rooms were in the house and whether they were furnished; how many acres of land were attached as policies and gardens ground; how long had these subjects been owned by the State; to whom were they now let; what was the total annual gross average receipts from these subjects, including sporting rental; what were the total annual average payments, including wages to gamekeepers, gardeners, rates, and general upkeep; and whether he would consider in future using this mansion house as a hostel, guest house, or holiday home for sick persons, and operated by approved societies, or otherwise.—Sir G. COLLINS replied: Raasay estate, including the mansion house, was acquired by the department at Candlemas, 1922. The house contains 45 rooms, with domestic offices, and is furnished. The garden and policies extend to about 15½ acres. The house is normally let along with the sporting rights, but has not yet been let for the coming season. The average annual gross receipts from lets in recent years amounted to approximately £310. The average annual expenditure on wages, rent, and general upkeep has been approximately £390. With regard to the last part of the question, although the house provides the only accommodation on the island for a tenant of the sporting subjects, I shall give consideration to any proposals submitted by approved

societies for utilising the house in the manner indicated by the hon. Member.

Disease Carrier—Iver Heath

Mr. GROVES asked the Minister of Health whether the order for the removal to hospital of the cattleman at Iver Heath was obtained by the medical officer of health from magistrates sitting in public or privately from one magistrate.—Sir HILTON YOUNG replied: I understand that this order was issued by a single justice.

MONDAY, MAY 13TH

Ex-Service Men and Epilepsy

Mr. HALL-CAINE asked the Minister of Pensions the number of applications made by ex-Service men for pensions in respect of epilepsy which they attributed to their war service, and in how many cases pensions had been granted.—Major TRYON replied: I have no record of the number of claims for pension that have been made in respect of epilepsy. The aggregate number of pensions that have been granted in respect of this disease is 8412.

Detention of Disease Carrier at Iver, Bucks

Sir ARNOLD WILSON asked the Minister of Health whether he was aware that W. Barrett, a cattleman at Dromenagh Farm, Iver, Bucks, had been detained since March 12th in the isolation hospital at Cippenham on the unsupported statement of a single medical officer that he was suffering from an infectious disease, though he was at that date, and was now, considered by another doctor to be free from any disease; and whether he would procure his immediate release without prejudice to any claim he might put forward for damages for illegal detention.—Mr. SHAKESPEARE replied: My right hon. friend understands that the man referred to was not detained in the isolation hospital on the unsupported statement of a single medical officer, but that eight consecutive bacteriological examinations of swabs taken from his throat disclosed the presence of hæmolytic streptococci. My right hon. friend is informed that he was discharged from hospital as soon as bacteriological examination indicated that the organisms were no longer present.

Sir ARNOLD WILSON asked the Minister of Health whether his attention had been drawn to the statement at pages 96 to 98 of the Report on the Health of the Army for 1932, that no appreciable decrease in the total dysentery figures had occurred during the five years in which an extensive search for dysentery carriers had been in operation, and that routine investigation for carriers had been abandoned in view of the injustice entailed to individuals; and whether, in view of the fact that hæmolytic streptococci, which were the cause of the isolation of a cowman at Cippenham Isolation Hospital, were frequently found in healthy persons, he would institute inquiries with a view to preventing injustice to individuals in such cases.—Mr. SHAKESPEARE replied: The answer to the first part of the question is in the affirmative, but my right hon. friend is advised that dysentery is not comparable with the streptococcal infections, and that the isolation of the man referred to in the second part of the question was, in the circumstances of the case, the proper course. He was isolated not merely because of the finding of certain organisms in his throat, but as a result of a combination of bacteriological findings and epidemiological evidence. My right hon. friend sees no necessity for special inquiries on this subject.

Soldier's Detention in Mental Hospital

Mr. THORNE asked the Secretary of State for Scotland if he could give the House any information in connexion with the case of John Mulholland, late private in the Highland Light Infantry, who was at present an inmate of the Lochgilphead Mental Hospital; whether any application had been received for the release of this man, who was stated to be sane; and what action he proposed to take in the matter.—Sir GODFREY COLLINS: I have made inquiry and find that Mr. John Mulholland has been an inmate of the Argyll and Bute District Asylum at Lochgilphead, under a sheriff's order, since Dec. 28th, 1934. When admitted he was suffering from epilepsy and mental confusion. No communication regarding his discharge has been received by the General Board of Control for Scotland. I am taking immediate steps to have further inquiries made into the circumstances of the case. In the meantime I may say that Mr. Mulholland's mental state and general health have considerably improved during his residence in the asylum.

TUESDAY, MAY 14TH

Medical Examinations of Army Officers

Captain CUNNINGHAM-REID asked the Financial Secretary to the War Office (1) how many officers of the rank of colonel and of each rank of general officer had, during the past 12 months, been found not to be fit in all respects for active service; and how many of those so found unfit were still on full pay; and (2) whether all colonels and general officers had been medically examined during the past 12 months; and, if so, whether any reductions in the ages for compulsory retirement of colonels and the various ranks of general officers were contemplated as a result of these medical examinations.—Mr. DOUGLAS HACKING replied: With the permission of my hon. and gallant friend, I will answer this question and No. 2 together. All general officers and colonels who are employed on full pay have been medically examined during the last 12 months. Four officers of these ranks were found by medical boards to be unfit, and only one of them remains on full pay. Officers found to be temporarily unfit are removed to the half-pay list when they have exhausted their sick leave or are pronounced permanently unfit for general service. No reductions in the ages for compulsory retirement of officers of these ranks are contemplated.

Reconditioning of Houses

Mr. JOEL asked the Minister of Health whether the Government had ever considered the desirability of making a grant for the reconditioning of houses, both by local authorities and by private owners; and what were its views on this subject.—Mr. SHAKESPEARE replied: Yes, Sir. The Government have given careful consideration to this question, and are of the opinion that the needs of the situation will be adequately met by the Housing (Rural Workers) Acts, 1926–1931, as proposed to be amended by the Housing Bill now before Parliament and by the general provisions of that Bill.

Imports of Processed Milk Products

Sir PERCY HURD asked the Minister of Agriculture whether, in view of the increased production of milk this summer and the greater output of condensed milk and dried milk in this country, the Government was taking further steps to check by quantitative restriction or tariffs the importations of processed milk products.—Mr. ELLIOT replied: The Governments of the foreign countries mainly concerned in the United Kingdom market with condensed milk, milk powder, and cream have been asked to arrange for certain additional reductions in supplies as from April 1st last, the reductions in each case being based on imports during the corresponding months of the year previous to the introduction of voluntary import regulation—namely, June, 1932, to May, 1933. Arrangements are also being made to secure reductions in imports of condensed whole milk, condensed skimmed milk, and cream from the Irish Free State. As my hon. friend will be aware, imports of processed milks from foreign countries are already subject to customs duties. It is understood that the interests concerned have under consideration an application to the Import Duties Advisory Committee for additional duties on condensed skimmed milk, condensed whole milk, and milk powder (the duty on cream has been conventionalised under the Anglo-Danish Trade Agreement which operates until June, 1936). If such an application is made, future policy will be considered in the light of any recommendations received from the Import Duties Advisory Committee. The following statement gives details of the reductions referred to above:

Condensed skimmed milk: 10 per cent. (making 40 per cent. in all) during the six months to Sept. 30th. Condensed whole milk: 5 per cent. (making 35 per cent. in all) during the quarter ending June 30th, and a further 5 per cent. during the quarter ending Sept. 30th. Milk powder: 5 per cent. (making 30 per cent. in all) during the quarter ending June 30th, and a further 5 per cent. during the quarter ending Sept. 30th. Cream: 5 per cent. (making 40 per cent. in all) during the quarter

ending June 30th, and a further 5 per cent. in each of the quarters ending Sept. 30th and Dec. 31st.

Pensioners and Disseminated Sclerosis

Mr. HUTCHISON asked the Minister of Pensions whether any pensions had been granted to applicants suffering from disseminated sclerosis attributed to war service; and, if so, whether he could give the numbers of such pensions.—Major TRYON replied: Pensions have been granted in a certain number of cases for the disease referred to, but I am unable to quote figures as they are not separately classified in the records of the Ministry.

MEDICAL NEWS

Royal College of Surgeons of England

At a meeting of the council of the college held on May 9th, with Sir Holburt Waring, the president, in the chair, Dr. W. T. Gordon Pugh and Mr. H. E. G. Boyle, members of 20 years' standing, were admitted to the fellowship.

Mr. C. Bowdler Henry was appointed as the representative of the college at the ninth international dental congress to be held in Vienna in August, 1936. Mr. G. C. Knight and Dr. D. Slome were reappointed Leverhulme scholars for a third year from July 1st. The president reported that he performed the opening of the new building of the Royal Australasian College of Surgeons in Melbourne on March 4th, and that he presented to Mr. E. S. J. King the certificate of the award to him of the Jacksonian prize for 1933. Diplomas of membership were granted to the following candidates in addition to those mentioned in our issues of May 4th and 11th:—

H. F. Anderson, Camb. and St. George's; Margaret Brodigan, Univ. Coll.; J. E. Elliott, Guy's Hosp.; and K. D. Gibson, Camb. and St. George's.

A diploma in gynæcology and obstetrics was granted jointly with the Royal College of Physicians, to Roland Hodgson Nattrass.

University of London

On May 20th and 27th, at University College Hospital medical school, at 5.15 P.M., Prof. Charles Singer is giving two further lectures on the history of medicine. On May 20th he will speak on recent additions to the history of syphilis, and on May 27th on medicine in America.

University of Glasgow

The Struthers gold medal and prize has been awarded to Dr. Thomas Nicol, lecturer in regional anatomy in the University.

University of Manchester

Dr. H. L. Sheehan, lecturer in pathology, has resigned his post on his appointment as director of the research department in the Glasgow Maternity Hospital.

International Association of Thalassotherapy

The seventh congress of this association will be held at San Sebastian from July 27th to 30th. The chief subjects of discussion will be the treatment of cervical adenitis, and the indications and contra-indications of sun-bathing. Information may be had from the organising committee, Asociación Internacional de Talasoterapia, Plaza del Buen Pastor, 20, San Sebastián, Guipúzcoa, Spain.

Lebanon Hospital for Mental Diseases

The thirty-sixth annual meeting of this hospital will be held at Friends House, Euston-road, London, N.W., on Monday, May 20th, at 4.30 P.M., when Lord Alness will be in the chair. The speakers will include Dr. Percy Smith.

Lincoln County Hospital

It is hoped to open the first of the new wards built under the extension scheme before the end of June. The number of patients is steadily increasing, and in the first three months of the year the hospital dealt with 300 emergencies and accident cases.

Chadwick Public Lectures

A lecture on educational and preventive physical exercises will be given on Thursday, May 23rd, at 5.30 P.M., at Manson House, 26, Portland-place, London, W., by Miss Noel Tidy, and Sir James Crichton-Browne, F.R.S., will preside. On June 6th, at the Chelsea Physic Garden, Swan Walk, Chelsea, Sir John Russell, F.R.S., will speak on modern changes in food production and their influence on our sources of supply. These lectures have been arranged by the Chadwick Trust, and the secretary may be addressed at 204, Abbey House, Westminster, S.W.1.

Royal College of Physicians of Edinburgh

A quarterly meeting of the College was held on May 7th with Dr. Edwin Bramwell, the president, in the chair. Dr. Alexander Hay Rintoul (Crieff) was elected a Fellow of the College. The Freeland Barbour fellowship was awarded to Mr. R. R. Goodall.

Royal Medico-Psychological Association

The ninety-fourth annual meeting of the association will be held from July 3rd to 5th, at 11, Chandos-street, London, W., and the guildhall of the Middlesex county council, Westminster, S.W. Visits have been arranged to Springfield Hospital and Shenley Hospital. The secretary is Dr. Reginald Worth, Springfield Mental Hospital, near Tooting, London, S.W. 17.

Royal Sanitary Institute

Immunisation in theory and practice, and housing with special reference to overcrowding, will be discussed at a sessional meeting of this institute to be held in the Town Hall, Carlisle, on Friday, May 24th. The first discussion will be introduced by Dr. J. Steven Faulds and Dr. J. C. B. Craig, and the second by Dr. Allan Semple, medical officer of health of Carlisle, and Mr. W. Hanson. Particulars may be had from Dr. Semple.

University of London Medical Graduates Society

The annual dinner of this society was held at the Langham Hotel on May 7th, Mr. McAdam Eccles presiding. Before grace, a message of loyal congratulation was sent to T.M. the King and Queen on the occasion of their Silver Jubilee. The toast of the society was proposed by the president, who announced a great increase in membership during the past year, and said he would be meeting London medical graduates at every port of call on his journey to and from Melbourne. Sir Charlton Briscoe responded in a humorous speech. The guests of the evening were the dean and the professorial staff of the British Postgraduate School at Hammersmith. In proposing their health, the president paid tribute in turn to the qualities of Col. Proctor, Prof. Fraser, Prof. Grey Turner, Prof. Young, and Prof. Kettle. Prof. Fraser, in replying, outlined the schemes proposed for the instruction of every type of medical graduate from home and abroad.

University of Sheffield

The council of the University has invited Dr. H. N. Green, at present lecturer in pathology in the University of Cambridge, to succeed Prof. Florey in the chair of pathology.

Dr. Green was educated at the University of Sheffield where he has the degrees of M.D. and M.Sc. Qualifying in 1924 he held several resident appointments at the Sheffield Royal Infirmary. On joining the pharmacological department under Prof. Edward Mellanby, he became interested in nutritional problems and was associated in Mellanby's work on calcification and on vitamin A in relation to infection. This led to a study of the vitamin A content of human liver in puerperal sepsis, reported in THE LANCET in 1932. Latterly Dr. Green has been demonstrator in pathology in the University of Cambridge, and his investigations of vitamin A deficiency have given rise to research into fat metabolism and serum esterase, a recent paper being concerned with changes induced by cancer and carcinogenetic agents.

Mr. A. C. W. Hutchinson, dean of the Edinburgh Dental Hospital and School, has been appointed professor of dental surgery; Dr. R. E. Pleasance, honorary lecturer in anæsthetics; and Dr. W. J. Clancy, honorary demonstrator in obstetrics. Dr. Dorothy Brown has resigned her post of lecturer in bacteriology; Dr. Percival Hay his post of lecturer in ophthalmology; and Dr. B. D. Pullinger her post of demonstrator in pathology.

Kent and Canterbury Hospital

The Duke of Kent has promised to lay the foundation-stone of this hospital on Friday, July 12th.

Sir Ernest Graham-Little has been elected for the ninth time in succession to represent medical graduates of Convocation upon the Senate of the University of London.

Dr. Lawson Gifford and Dr. T. J. Hallinan have been appointed members of the Legislative Council of the Island of Jamaica.

Bolingbroke Hospital

The rebuilding scheme of this hospital is to cost £70,000 ; that there is sometimes a waiting list of 250 for admission to the wards demonstrates its urgency. A sum of £10,000 has been collected, and King Edward's Hospital fund has promised £1000. The old mansion part of the building continues to deteriorate.

Ear, Nose, and Throat Congress in Vienna

The first congress of the Austrian otolaryngologists will be held in Vienna on June 21st and 22nd. Prof. M. Hajek (Vienna), Prof. G. Hofer (Graz), Prof. W. Krainz (Innsbruck), and Prof. H. Neumann (Vienna) will take the chair at the various sessions. The subjects of discussion will include vertigo, otogenic meningitis, postanginal complications, and new methods of speech training. The secretary of the congress is Ernst Urbant Schitsch, Wien, I., Schottenring 24.

Inter-State Post-Graduate Medical Association of North America

Some 30 members of this body are paying a visit to London at the end of May. Visits have been arranged for them to the Middlesex Hospital on Monday, May 27th, to Guy's Hospital on May 28th, and to St. Bartholomew's Hospital on the 29th. At this last meeting, which will take place in the afternoon, a special programme of clinical demonstrations has been arranged. Mr. Philip Franklin (27, Wimpole-street, W.1) is in charge of the clinical arrangements.

St. John's Hospital for Diseases of the Skin

New premises for out-patients are to be provided at Lisle-street, Leicester-square, and should be open by the end of the year. The landowners of the present out-patient department are prepared to allow the hospital the sum of £23,500 for the surrender of the lease of the building, leaving about £10,000 to be raised to prepare and equip the new department. The work of the electro-therapeutic department has been much extended.

Carnegie Grants for Medical Work

Eight Carnegie grants have been awarded to South Africa for 1935–36, and two of the recipients are medical men. Dr. D. L. Ferguson, medical officer of health for Port Elizabeth, will study the national and municipal control of food supplies, with especial reference to milk and pasteurisation, and the housing of the poorer classes, especially where two or more races are involved. Dr. C. C. P. Anning, M.O.H. for Pietermaritzburg, is to investigate the administration and practice of tuberculosis control, and the training of non-Europeans in hygiene and sanitation.

Mosquito Day

On Monday last Mosquito Day was celebrated by a luncheon in honour of Patrick Manson and Ronald Ross, held at the London School of Hygiene and Tropical Medicine. Since the amalgamation of the Ross Institute with the School it has been considered fitting that the name of Manson should be linked with that of Ross in holding what has been for some years an annual celebration, and the day will in future be May 13th. Sir Austen Chamberlain, chairman of the governors of the School, who presided, spoke of the foundation of the Institute and of the School, and of the work which both were doing in the control of malaria. He recalled that his father, Joseph Chamberlain, had sought out Manson to be his medical adviser at the Colonial Office. Sir George Newman, speaking as the oldest personal friend of Sir Ronald Ross present at the gathering, said he could name no other discovery of life-saving value which had been so promptly appreciated by the persons interested. It had been shown that the work of science could be translated both into the saving of lives and the economic production of rubber and tea.

Queen's University, Belfast

Colonel S. H. Browne, a graduate of the old Queen's College, Belfast, and formerly of the Indian Medical Service, has left a legacy of £10,000 to the University to found a scholarship for the promotion of medical research in the university. The amount and conditions of the awards will in due course be determined by the academic authorities.

New Hospital for Leek

The growing population of Leek is demanding a new hospital to relieve the pressure on the North Staffordshire Royal Infirmary. The weekly cost per occupied bed was £2 18*s*. 10*d*., and the deficit on the hospital's general account is £532.

Derbyshire Royal Infirmary

The work of this hospital continues to increase ; the daily average of beds occupied is 331, which is the highest on record. The wards are overcrowded, and it is hoped to begin on the new building scheme shortly. Mr. J. H. Thomas has given £1000 for the endowment of a bed to commemorate his silver jubilee as Member of Parliament for Derby.

Medical Prayer Union

The annual medical missionary breakfast of the union will be held at the Refectory, University College, Gower-street, on Wednesday, May 29th, at 8 A.M. The chair will be taken by Mr. W. McAdam Eccles, and an address given by Dr. Fredk. N. Green of the Church Missionary Society, Maseno, E. Africa. Those wishing to attend should notify the hon. secretary, Dr. Tom Jays, Livingstone College, Leyton, E.10.

Mount Vernon Hospital

Last year 673 persons were admitted to the wards but the hospital's activities are seriously handicapped by lack of money, and it will be impossible to increase the number of occupied beds until the radiological department has been enlarged and additional apparatus provided. This would cost £10,000, and another £10,000 is needed for maintenance. The income fails to meet expenditure by £5000.

International Society of Medical Hydrology

The annual meeting of this society will be held in Brussels from Oct. 12th to 17th. On Oct. 13th a discussion on the action of carbon dioxide baths on the peripheral circulation will be opened by Dr. E. Guilleaume and Dr. Marcel Wybauw (Belgium), Dr. P. N. Deschamps (France), and Prof. H. Vogt and Dr. R. Wachter (Germany), while on Oct. 14th Prof. Scherbakov (Jugoslavia), Prof. S. Pisani (Italy), and Prof. V. Mladejovsky (Czechoslovakia) will speak on the therapeutic action of muds. On the two following days a visit will be made to Luxembourg to inspect the establishments at Mondorf and Spa. On Oct. 17th a third medical discussion on therapeutic agencies of the sea coast will be held at Ostend, and papers will be read by Prof. I. Gunzburg (Belgium) and Dr. W. G. Willoughby (Great Britain). The secretary of the society may be addressed at 109, Kingsway, London, W.C.2.

Congress of Gastro-enterology

The first international congress of gastro-enterology is to be held in Brussels from August 8th to 11th, under the presidency of Dr. M. J. Schoemaker, of the Hague. The members will meet in sections of medicine, surgery, radiology, and pathology, and in addition there will be two general meetings, for discussion of gastritis and severe ulcerative colitis (non-amœbic). An international society of gastro-enterology will, it is hoped, be founded. The secretary-general of the congress is Dr. Georges Brohée, 64, Rue de la Concorde, Brussels. An English committee has been formed, with Sir William Hale-White and Dr. A. F. Hurst as honorary president and president respectively. The other members are Dr. Adolphe Abrahams, Dr. T. L. Hardy, Mr. John Morley, Dr. J. W. McNee, Dr. J. A. Ryle, Dr. C. K. Simpson, Sir Edmund Spriggs, Prof. W. W. D. Thomson, Mr. A. J. Walton, and Prof. D. P. D. Wilkie. Dr. Thomas Hunt (12, Queen Anne-street, London, W.) is the hon. secretary.

Medical Congresses in Brussels

The Journées Médicales de Bruxelles will be held this year from June 29th to July 3rd under the presidency of Dr. Edgard Zunz, professor of pharmacology of the faculty of medicine. The main subject of discussion is to be the physiopathology of the endocrine glands, and Prof. George Barger (Edinburgh) will be among the speakers. The secretary of the congress is Dr. R. Beckers, 141, rue Belliard, Brussels. As already announced, the meeting of the Belgian Society for Physical Education will also take place at the same time (June 30th to July 3rd).

From Sept. 12th–19th the Tomarkin foundation is arranging to hold its seventh international medical post-graduate congress in Brussels. The lecturers will include Sir Crisp English, U. Friedemann, J. Plesch, and W. Levinthal (London), C. Heymans (Ghent), A. S. Hyman (New York), J. Schwartzmann (Odessa), M. Ascoli (Palermo), C. Regaud, N. Fressinger, A. Besredka, C. Levaditi, and M. P. Weil (Paris), E. Loewenstein (Vienna), P. Ulenhüth (Freiburg), and A. J. D. Cameron (Tunbridge Wells). The secretary of the foundation may be addressed at the Faculty of Medicine, 97, Rue aux Laines, Brussels.

Fellowship of Medicine and Post-Graduate Medical Association

Courses will be given in gynæcology at the Chelsea Hospital from May 27th to June 8th; in chest diseases, City of London Hospital, Victoria Park, from May 27th to June 1st; in venereal disease, London Lock Hospital, from May 27th to June 22nd; in chest and heart diseases at the Victoria Park Hospital (6 P.M. on Wednesdays and Fridays) from June 5th to 28th; in chest diseases at the Brompton Hospital (at 5 P.M on two days a week) during June. There will also be a clinical and pathological course at the National Temperance Hospital at 8 P.M. Tuesdays and Thursdays, from June 11th to 28th. Week-end courses will be given as follows: obstetrics at the City of London Maternity Hospital, May 25th and 26th; fevers at the Park Hospital, Hither Green, June 15th and 16th. Other forthcoming courses include urology at St. Peter's Hospital, June 17th to 29th; medicine, surgery, and the specialties at the Prince of Wales Hospital, June 17th to 29th and July 1st to 13th; cardiology at the National Heart Hospital, June 24th to July 6th. Daily clinical instruction in various branches of medicine and surgery is available through a panel of teachers. A supper-dance and cabaret has been arranged to take place at Claridge's on Wednesday, June 5th, at 9.30 P.M. Tickets can be obtained from the Fellowship, 1, Wimpole-street, W. 1.

Medical Diary

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
TUESDAY, May 21st.
Special Meeting of Fellows. 5 P.M. *General Meeting of Fellows,* 5.30 P.M.
WEDNESDAY.
Comparative Medicine. 5 P.M. (Royal Army Medical College, Grosvenor-road, S.W.), Annual General Meeting. Demonstrations: G. R. Cameron and W. A. E. Karunaratne: Liver Changes in Exophthalmic Goitre. W. A. E. Karunaratne: Rhinosporidiosis in Man. C. L. Oakley: Tuberculosis in the Dog. E. S. Duthie: Mitochondria and Cell Survival. J. A. Boycott: Agglutination Reaction in Glandular Fever. G. H. Eagles: Spontaneous Encephalitis in the Monkey. Also demonstrations by E. L. Taylor, E. Klieneberger, J. R. M. Innes, J. A. Nicholson and J. Stewart, E. J. Pullinger, and A. W. Stableforth.
THURSDAY.
Urology. 8.30 P.M., Annual General Meeting. Discussion on the Scope and Indications for Renal Sympathectomy, to be opened by Mr. S. Harry Harris (Sydney).
FRIDAY.
Disease in Children. 5 P.M., Annual General Meeting. Cases: Dr. Raymond Kirk (for Dr. G. Bray): 1. Urticaria Pigmentosa of the Nodular Type. Dr. John Gibbens: 2. Malignant Tumour of the Liver ? secondary to a Suprarenal Tumour. Dr. Branford Morgan: 3. Coarctation of Aorta, with unusual Radiological Shadow. Dr. R. Bailey (for Dr. D. Paterson): 4. Tumour of the Left Iliac Fossa.
Epidemiology and State Medicine. 8 P.M., Annual General Meeting. Dr. Gordon Pickles: Epidemiology in Country Practice.

MEDICO-LEGAL SOCIETY.
THURSDAY, May 23rd.—8.30 P.M. (11, Chandos-street, W.), Dr. T. H. Blench: A Police Surgeon's Problems.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY, 49, Leicester-square, W.C.
WEDNESDAY, May 22nd.—4.30 P.M., Clinical Cases.

CHELSEA CLINICAL SOCIETY.
TUESDAY, May 21st.—8.30 P.M. (Hotel Rembrandt, Thurloe-place, S.W.), Dr. Millais Culpin: Sex Problems in Practice.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.
TUESDAY, May 21st.—5 P.M., Sir Edmund Spriggs: A Clinical Study of Headaches. (Last Croonian lecture.)

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, May 20th, to SATURDAY, May 25th.—MAUDSLEY HOSPITAL, Denmark-hill, S.E. Afternoon course in psychological medicine.—ST. JOHN'S HOSPITAL, Leicester-square, W.C. Afternoon course in dermatology. (Open to all.)—GORDON HOSPITAL, Vauxhall Bridge-road, S.E. All-day course in proctology.—CITY OF LONDON MATERNITY HOSPITAL, City-road, E.C. Week-end course in obstetrics.—Courses arranged by the Fellowship are open only to members and associates.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.
MONDAY, May 20th.—10 A.M., Medical and Surgical Wards, Genito-urinary Operations, Skin Clinic. 2 P.M., Gynæcological and Surgical Wards, Eye and Gynæcological Clinics.
TUESDAY.—10 A.M., Medical Wards. 11 A.M., Surgical Wards. 2 P.M., Nose, Throat, and Ear Clinic. 4.15 P.M., Dr. Redvers Ironside: Coma.
WEDNESDAY.—10 A.M., Medical Wards, Children's Wards and Clinic. 2 P.M., Gynæcological Operations and Eye Clinic.
THURSDAY.—10 A.M., Neurological and Gynæcological Clinics. 12 noon, Fracture Demonstration. 2 P.M., Genito-urinary and Eye Clinics. 3.45 P.M., Venereal Diseases Clinic.
FRIDAY.—10 A.M., Skin Clinic. Noon, Lecture on Treatment. 2 P.M., Throat, Nose, and Ear Clinic. 4.15 P.M., Mr. Roche: Urethral Stricture.
SATURDAY.—10 A.M., Medical Wards, Children's and Surgical Clinics.
Daily at 2 P.M., Operations, Medical and Surgical Clinics. The lectures at 4.15 P.M. are open to all medical practitioners without fee.

ST. MARY'S HOSPITAL, W.2.
THURSDAY, May 23rd.—5 P.M. (Institute of Pathology), Dr. C. H. Andrewes: The Cancer Problem: Some Fresh Clues.

LONDON SCHOOL OF DERMATOLOGY, 49, Leicester-square, W.C.
MONDAY, May 20th.—5 P.M., Dr. H. D. Haldin-Davis: Drug Eruptions.
TUESDAY.—5 P.M., Dr. J. E. M. Wigley: Napkin Area Eruptions.
THURSDAY.—5 P.M., Dr. A. C. Roxburgh: Differential Diagnosis of some Common Skin Diseases.
FRIDAY.—5 P.M., Dr. W. J. O'Donovan: Tuberculosis of the Skin.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.
MONDAY, May 20th, to SATURDAY, May 25th.—Intensive Clinical Course. (Second week.)

HOSPITAL FOR EPILEPSY AND PARALYSIS, Maida Vale, W.
THURSDAY, May 23rd.—3 P.M., Dr. Douglas McAlpine: Demonstration.

HOSPITAL FOR SICK CHILDREN, Great Ormond-st., W.C.
THURSDAY, May 23rd.—2 P.M., Dr. B. E. Schlesinger: Endocrine Disorders. 3 P.M., Dr. D. N. Nabarro: Meningitis: (2) Treatment.
Out-patient clinics daily at 10 A.M. and ward visits (except Wednesday) at 2 P.M.

NATIONAL INSTITUTE OF INDUSTRIAL PSYCHOLOGY.
MONDAY, May 20th.—5.30 P.M. (London School of Hygiene and Tropical Medicine, 1, Keppel-street, W.C.), Prof. M. Greenwood, F.R.S.: Temperaments, Physical and Psychological, in Modern Science.

INSTITUTE OF MEDICAL PSYCHOLOGY, Malet-place, W.C.
WEDNESDAY, May 22nd.—3 P.M., Dr. H. Crichton-Miller: Hysteria. 4.30 P.M., Dr. Cedric Shaw: Cardiovascular Syndromes.

ROYAL INFIRMARY, Manchester.
TUESDAY, May 21st.—4.15 P.M., Dr. N. Kletz: On Constipation.
FRIDAY.—4.15 P.M., Dr. J. Wharton: Demonstration of Ophthalmic Cases.

UNIVERSITY OF BIRMINGHAM.
TUESDAY, May 21st.—3.30 P.M. (General Hospital), Mr. H. H. Sampson: Demonstration of Surgical Cases.
WEDNESDAY.—3.30 P.M. (Anatomy Theatre, The University), Dr. Howard Collier: Industrial Organic Toxins.
FRIDAY.—3.30 P.M. (Queen's Hospital), Mr. T. S. Donovan: Fractures and Minor Orthopædics.

UNIVERSITY OF DURHAM COLLEGE OF MEDICINE.
SUNDAY, May 19th.—10.30 A.M. (Newcastle General Hospital), Dr. F. J. Nattrass: Medical Ward Visit.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.
WEDNESDAY, May 22nd.—4.15 P.M. (Royal Infirmary), Dr. David Smith: Medical Cases.

ROYAL INFIRMARY, Dundee.
THURSDAY, May 23rd.—3.15 P.M., Dr. J. Thomson: Diseases of Children, Clinical Cases. 4.15 P.M., Dr. W. L. Kinnear: Diseases of Children: the Treatment of some Pulmonary Affections.

Appointments

BLATCHLEY, DONALD, M.B. Edin., has been appointed Hon. Anæsthetist to the Hospital for Women, Soho-square.

CHAMINGS, A. J. WILSON, F.R.C.S. Eng., Hon. Laryngologist to the Woolwich and District War Memorial Hospital.

LESLIE, W., M.B. Lond., F.R.C.S. Eng., Senior Assistant Medical Officer (Grade I.) to St. Luke's Hospital, Chelsea.

ORD, J. W. E., M.D. McGill, Hon. Anæsthetist to the Willesden General Hospital.

PARKER, G. E., F.R.C.S. Eng., Surgical Registrar to the Woolwich and District War Memorial Hospital.

Middlesex County Council.—The following senior medical appointments at County hospitals are announced:—

BIRCH, C. A., M.D. Liverp., M.R.C.P. Lond., Senior Physician, North Middlesex;

GALLOWAY, R. L., M.B., F.R.C.S. Edin., Senior Surgeon, North Middlesex;

HUDSON, K. A., M.B. Sydney, M.C.O.G., Senior Obstetrician, North Middlesex;

JACKSON, E. B., M.D., M.R.C.P. Lond., Physician, Hillingdon;

JAMES, T. G. ILLTYD, M.Ch. Wales, F.R.C.S. Eng., Senior Surgeon, Central Middlesex;

JOULES, HORACE, M.D., M.R.C.P. Lond., Senior Physician, Central Middlesex;

NELSON, T. S., B.M. Oxon., F.R.C.P. Lond., Senior Physician, West Middlesex;

ROSSER, E. AP I., M.R.C.S. Eng., Obstetrician, Redhill.

STERN, D. M., M.B. Camb., F.R.C.S. Eng., Obstetrician, West Middlesex; and

WEBB, C. H. S., M.S. Lond., F.R.C.S. Eng., Senior Surgeon, West Middlesex.

Medical Referee under the Workmen's Compensation Act, 1925: Dr. R. C. AITCHISON, of Selkirk, for the Selkirk Sheriff Court District (Sheriffdom of Roxburgh, Berwick, and Selkirk).

Certifying Surgeons under the Factory and Workshop Acts: Dr. D. C. PIM (Abergavenny District, Monmouthshire).

Vacancies

For further information refer to the advertisement columns

Aberdeen Royal Infirmary.—Two Hon. Clin. Tutors.

Acton Borough Education Committee.—Asst. School M.O., &c. £550.

All Saints' Hospital, Austral-street, S.E.—Res. H.S. At rate of £100.

Antrim C.C.—Chief Tuber. M.O. £750.

Barnsley, Beckett Hospital and Dispensary.—Cas. O. £250.

Barnstaple, North Devon Infirmary.—Res. M.O. At rate of £150.

Bath, Royal United Hospital.—Out-patient and Cas. O. £150. Also Hon. Surg. for Ear, Nose, and Throat Dept., and Hon. Med. Reg.

Beckenham, Bethlem Royal Hospital, Monks Orchard.—Radiologist. 150 guineas.

Bedford County Hospital.—First and Second H.S. At rate of £155 and £150 respectively.

Birmingham, Selly Oak Hospital.—Res. Physician. £650.

Bolton Royal Infirmary.—Two H.S.'s. Each £125.

Bournemouth, Royal National Sanatorium for Consumption, &c.—Consulting Phys.

Bradford, Grassington Sanatorium.—Asst Res. M.O. £175.

Brighton, New Sussex Hospital for Women, Windlesham-road.—H.P. £100.

Brighton, Royal Alexandra Hospital for Sick Children.—H.S. £120.

Buxton, Devonshire Royal Hospital.—H.P. £200. Also Asst. H.P. At rate of £150.

Canterbury, Kent, and Canterbury Hospital.—Two H.S.'s. Each at rate of £125.

Cardiff, Welsh National School of Medicine.—Jun. Asst. in Medical Unit. £250.

Charing Cross Hospital, W.C.—Asst. Physician. Also Hon, First Asst. for Orthopædic Dept.

Chelsea Hospital for Women, Arthur-street, S.W.—Jun. H.S. At rate of £100.

City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—H.P. At rate of £100.

Coventry and Warwickshire Hospital.—H.S. for Aural and Ophth. Depts. At rate of £125.

Derbyshire Royal Infirmary.—Ophth. H.S. and Anæsthetist. £150.

Ealing Borough.—Asst. M.O. £450.

Elizabeth Garrett Anderson Hospital, Euston-road, N.W.—Clin. Asst. to Ear, Nose, and Throat Dept. Also H.P., three H.S.'s, and Obstet. Asst. Each at rate of £50.

Evelina Hospital for Sick Children, Southwark, S.E.—H.P. Also H.S. Each at rate of £120.

Golden-square, Throat, Nose, and Ear Hospital, W.—H.S. At rate of £100.

Grimsby Corporation Hospital.—Res. M.O. £350.

Hartlepools Hospital.—H.S. At rate of £150.

Hastings, Royal East Sussex Hospital.—Jun. H.S. At rate of £150.

Hertford County Hospital.—Sen. H.S. At rate of £200.

Hospital for Consumption and Diseases of the Chest, Brompton, S.W.—Asst. for Dept. of Pathology. £350. Also Asst. Physician.

Hospital for Sick Children, Great Ormond-street, W.C.—H.P. and H.S. Each at rate of £100.

Hull Royal Infirmary.—Cas. O. At rate of £150.

Indian Medical Service.—Commissions.

Iraq Government.—Appointments. Each £100–£120 per mensem.

Jersey General Hospital and Poor Law Infirmary.—Res. M.O. £100–£200.

King George Hospital, Ilford.—Res. Surg. O. and Res. Asst. Surg. O. £300 and £250 respectively. Also Two H.P.'s and Three H.S.'s. Each at rate of £100.

Lancaster, County Mental Hospital.—Asst. M.O. £500.

Lincoln City.—Deputy M.O.H. £600.

Lincoln County Hospital.—Jun. H.S. At rate of £150.

Liverpool Royal Babies' Hospital.—Res. M.O. At rate of £90.

Liverpool Sanatorium, Delamere Forest, Frodsham.—Second Asst. to Med. Supt. £200.

Liverpool, Stanley Hospital.—Surg. Reg. £50.

London Lock Hospital, Harrow-road.—Surg. Reg. £100.

London University.—Geoffrey Duveen Travelling Studentship. £450.

Macclesfield General Infirmary.—Second H.S. At rate of £150.

Manchester Ear Hospital.—Res. H.S. £120.

Manchester Royal Infirmary.—M.O. to Out-patients. £35.

Manchester, Withington Hospital and Institution.—Jun. Asst. M.O. At rate of £200.

Manchester and Salford Hospital for Skin Diseases, Quay-street.—Two Asst. M.O.'s. Each £100. Also H.S. At rate of £100.

Margaret-street Hospital for Consumption, W.—Hon. Dental Surgeon.

Margate, Royal Sea Bathing Hospital.—H.S. At rate of £200.

Middlesbrough, North Riding Infirmary.—Third H.S. £125.

Middlesex County Council.—Dist. M.O. £75. Also Public Vaccinator.

Miller General Hospital, Greenwich-road, S.E.—Out-patient Officer and Two Cas. O.'s. Each at rate of £150. Also H.P. and H.S. Each at rate of £100.

Newcastle-upon-Tyne Eye Hospital.—Jun. Res. H.S. £150.

Newcastle-upon-Tyne, Royal Victoria Infirmary, &c.—Temp. Asst. in Pathological Dept. £400—£600.

North Kensington Women's Welfare Centre, Telford-road, W.—M.O., Gynæcological Clinic.

Norwich City.—Asst. M.O.H. and Asst. School M.O. £500.

Nottingham City Mental Hospital.—Locum Tenens M.O. £7 7s. per week.

Oxford, Wingfield-Morris Orthopædic Hospital.—H.S. £100.

Paddington Hospital, Harrow-road, W.—Res. Med. Supt. £1100.

Plymouth, Prince of Wales's Hospital, Devonport.—H.P. and Cas. O. At rate of £100. Also Res. Surg. and H.S. At rate of £200 and £120 respectively.

Queen Mary's Hospital for the East End, E.—Res. M.O. and Two Cas. O.'s. Each £150. Also Two H.S.'s., H.P., Obstet. H.S., and Res. Anæsthetist. Each £120.

Queen's Hospital for Children, Hackney-road, E.—H.P. and Cas. O. Each at rate of £100.

Radium Institute, Riding House-street, W.—H.S. At rate of £150.

Reading, Royal Berkshire Hospital.—Hon. Asst. Surgeon. Also H.S. for Ophthalmic, &c., Dept. £125.

Rhondda U.D.C.—Sen. Asst. M.O. for Maternity and Child Welfare Work. £700. Also Temp. Asst. M.O. £10 per week.

Royal Chest Hospital, City-road, E.C.—Res. M.O. Also H.P. At rate of £150 and £100 respectively.

Royal Free Hospital, Gray's Inn-road, W.C.—First Asst. in Children's Dept. At rate of £115. Res. Cas. O. at rate of £150. Also First H.S. and Res. Anæsthetist.

Royal Northern Hospital, Holloway, N.—Radiologist. £580.

Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Cas O. £200. Also H.S. At rate of £100.

Ryde, Royal Isle of Wight County Hospital.—Res. H.S. At rate of £180.

St. George's Hospital, S.W.—Asst. Physician.

Sheffield, Jessop Hospital for Women.—Three H.S.'s. Each at rate of £100.

Sheffield Royal Hospital.—Clin. Asst. to Ear, Nose, and Throat Dept. £300.

Sheffield Royal Infirmary.—H.P. At rate of £80.

Sheffield Royal Infirmary and Royal Hospital.—Clin. Asst. £300.

Sheffield University.—Asst. Pathologist and Demonstrator. £500.

Singapore, King Edward VII. College of Medicine.—Dental O. and Lecturer in Dental Mechanics. $500 per mensem.

Southend-on-Sea General Hospital.—Med. Reg. £300. Surg. Reg. £250. Also H.S. to Orthopædic and Casualty Dept. At rate of £100.

South London Hospital for Women, Clapham Common, S.W.—H.P. and H.S. Each at rate of £100.

South Shields, Ingham Infirmary.—Sen. and Jun. H.S.'s. £200 and £150 respectively.

Stoke-on-Trent, Longton Hospital.—H.S. £160.

Swansea General and Eye Hospital.—H.S. At rate of £150.

Talgarth, South Wales Sanatorium.—Asst. Res. M.O. £200.

Truro, Royal Cornwall Infirmary.—H.S. £170.

University College Hospital, Gower-street, W.C.—Hon. Asst. Physician.

West End Hospital for Nervous Diseases, Regent's Park.—Hon. Anæsthetist.

West London Hospital, Hammersmith-road, W.—Chief Clin. Asst. in X Ray Dept. £125.

Weston-super-Mare General Hospital.—Res. H.P. £150.

Windsor, King Edward VII Hospital.—Res. M.O. £150.

Wolverhampton Royal Hospital.—H.S. At rate of £100.

Wolverhampton and Midland Counties Eye Infirmary.—H.S. £150.

Woolwich and District War Memorial Hospital, Shooters Hill, S.E. H.P. and H.S. Each at rate of £100.

Worksop, Victoria Hospital.—Two Residents. At rate of £150 and £120 respectively.

York City.—Sen. Asst. School M.O. Also Asst. school M.O. Each £500. Also Temp. Asst. M.O. £500, and Temp. Res. M.O. £250.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Lowestoft, Suffolk; and Loughborough, Leicestershire.

NOTES, COMMENTS, AND ABSTRACTS

THE MEDICAL STUDENT ON HIS TRAINING

IN the council chamber of B.M.A. House fifty medical students from various London schools met on Tuesday evening, at the invitation of the U.C.H. Medical Society, to debate the motion: "The inadequacy of medical education lies in the curriculum." Participation in this debate was limited to unqualified students, but Sir Ernest Graham-Little was in the chair, and three deans occupied places in the front row and listened with bland appreciation to criticisms of their teaching programme. For them the sting was mitigated by the disclaimers on the part both of opener and opposer of the motion that while, on the motion, they must speak mainly of grievances they were not unappreciative of efforts made by deans and others. They admitted they were not well read in the principles of medical education, and not knowing what the future had in store for them their views must be largely conjectural.

With that preface, as the opener remarked, "we let ourselves loose and say what we like," and he started himself with an attack on the division of the six years' course into three years' pre-clinical and three years' clinical. Did not the student, he asked, learn incomparably more in the clinical years? It seemed to him futile to start on a wide if somewhat dilute scientific basis. Some preliminary education in elementary science was no doubt desirable, but why concentrate on the curious copulations of the earthworm; and was a particular knowledge of mechanics necessary in order to assemble axis-traction forceps? Normal anatomy and physiology were not of any interest to the medical man except as modified by disease. A pineal body that never went wrong could be ignored for medical practice, and he made a special plea for extension of the clinical years, as he believed diagnosis to be a matter of developed intuition. Speaking as a musician he could diagnose music where others could diagnose motor-cars, neither being able to say how. The skilful diagnostician, he contended, knows from the look of the thing just like any connoisseur. Get in contact early with clinical medicine was his message. A little access to the wards will give nodding acquaintance with a rather forbidding terminology, and help to make anatomy live in surgery and physiology in medicine.

His opposer opened by postulating the inadequacy of all medical education and began an analogy between teaching and digestion which ran like a streak all through the subsequent discussion. What was wrong was not the pabulum but the ability to assimilate it. If we regard our teachers, he said, as the liver ("some are definite gallstones") then examiners are the kidney, with a threshold at times too low for the attractive substances offered by examinees. A later speaker would have it that the student body was suffering from a surfeit of fat things which no amount of bile will help him to assimilate. The opposer found fault not with the curriculum but in turn with the student, the teacher, and the examiner. Many students start too young; they come to medical schools having been spoon-fed, and few know how to work. The teacher should teach the student how to think; he was too apt to teach medicine and surgery but not how to be a physician or surgeon. No change in the curriculum could teach a man to think. That lay in the rôle of teacher who alone could produce an attitude of mind.

All through the evening arose again and again this criticism of the teacher and the examiner. The examiner was not necessarily qualified to examine or to form a true estimate of a candidate's work. He would not care himself to sit for examination in subjects other than his own. The first remark heard by a student on entering the wards was often: "If you had said that in an examination you would be referred for six months." This kind of playing up to examinations was harmful. The G.M.C. in 1922 had added four more subjects to the curriculum, apart from the emphasis on the preventive aspect of medicine. All these were added at the expense of apprenticeship in medicine, making the student's life one constant rush. Why, asked one speaker, were only 50 unqualified students present at this discussion? The rest were carefully learning facts at home. "We learn too much and know too little," he said. "This cannot go on."

An outline was given of a curriculum in which three years were spent on the principles of medicine for an academic degree not qualifying for practice, followed by two years of clinical work in one or other of the main faculties, with a diploma at the end entitling to practise; but the house was fairly equally divided in its preference for such an ad-hoc education over one in which the scientific principle was at the back of the programme in every year, and the student at liberty, as in the French system, to refresh his knowledge of anatomy and physiology at any time. There was profound disagreement about the position of preventive medicine in the curriculum. One side held that it could have little or no place in the training of the general practitioner; health could only be assessed by a study of deviations from the normal. Equally strenuous was the view that medicine is nothing if not applied physiology, and that the curriculum must be enlarged to include genetics and the results of industrial and environmental disease.

Throughout the discussion there was rather a pointed feeling of dissatisfaction with the character of the teaching itself. It was, said one, a bad day for the student when teachers in hospitals were voluntary. The attitude of the part-time teacher was: "Well, I'm obliging you, anyway." Everything was to be said for the unit system and the full-time teacher; "you can tell him what you want." But the meeting ended on a note of hopelessness in the prospect of change. Only students are interested in the curriculum; they alone can be the moving force in any change. But being very young, tactless, amenable to economic stress, and required to behave, what chance had he as a reformer?

To this Sir Ernest, in closing the meeting, remarked that students really had far more influence than that. They had, he thought, taken their share in bring about the report on the medical curriculum to be presented to the senate of London University the following day. He wished them success. The voting then taken gave 33 for and 18 against the motion, but the value of the evening was rather as a symposium than as a discussion.

RECREATIONAL GYMNASTICS

THE work of Miss Elli Björkstén is having a great influence upon the school and recreational gymnastics of this country; her methods are an adaptation especially for women and children of the Swedish traditional school.

In Part I. of her book on the principles of gymnastics for women and girls the broader outlines and theory of educational gymnastics with accompanying formal exercises were given; in Part II.[1] original game exercises for ages 8–13 years are planned on the basis of a four years' school training, and are grouped according to the movement classification of a normal gymnastic table. In a stimulating introduction, Miss Björkstén defines her aim as "ease combined with form." She discusses the use

[1] Principles of Gymnastics for Women and Girls. Part II. By Elli Björkstén, Senior Woman Teacher of Gymnastics at the University, Helsingfors. Translated by S. Kreuzer and G. H. Wicksteed. London: J. and A. Churchill Ltd. 1934. Pp. 591. 21s.

and abuse of rhythm and music in connexion with gymnastics; these are aids that are helpful only when they are used with discretion. A scheme is set out for the normal school gymnastic table of movements upon which these game-exercises are based. The table itself is too elaborate to be fitted into the time allotted to gymnastics in most schools.

The fundamental standing position, rest, marching, and running, are then analysed with insistence upon lightness and elasticity as essential to the proper performance of all exercises. The rest of the work is devoted to the imaginative presentation of movements. For instance, "arm circling" is called the "small windmill"; a foot movement is pictured as "ski-ing down a steep hill"; various positions are named "the scarecrow," "the crane," "the chimney sweep"; and movements are given such suggestive titles as "Indians escaping in canoes," "Cossacks on horseback," and so forth. For fourth-year students jumps and elementary apparatus work are described in a more straightforward manner.

Teachers alert to find means of varying and adapting the presentation of their work to small children will find this book useful, and those whose duty it is to supervise remedial exercises may be stimulated to invent appropriate play exercises on the same lines. Backward and defective children especially need the imaginative and mental stimulus this type of teaching gives, and there is but little technical literature available on the subject of their physical training. It is unlikely that any teacher would care to follow the whole book; many will find in it stimulating ideas which will help them to enliven their class-work.

SANDOZ PRODUCTS

A PAMPHLET, published by J. Flint, Sandoz Products (134, Wigmore-street, London), sets out recent views on the use of calcium in inflammatory processes. The essay divides the indications for calcium therapy into those directed towards remineralisation in condition of calcium deficiency and those where transmineralisation is sought, the insoluble salt not being deposited as an inactive body but developing on its way through the organism. The effects of transmineralisation, using calcium in therapeutic doses, are set out in detail and elaborately documented; over 150 authors are cited in the pamphlet, and the large number of references make the value of experimental evidence clear to the reader.

The practical application of calcium therapy will, it is claimed, be greatly assisted by the use of preparations coming from the Sandoz Research Laboratories. Calcium-Sandoz is an organic calcium salt, an oxidation product of glucose, which is completely utilised by the organism, thus providing the maximum therapeutic action of the salt. It contains 9 per cent. of calcium. It is supplied in powder for oral administration and in tablets flavoured with chocolate or effervescent. Ampoules of 10 per cent. and 20 per cent. sterile solutions are suggested for intravenous and intramuscular injection. Evidence is produced that Calcium-Sandoz intramuscularly is painless and non-irritating, while intravenously it is better tolerated than the chloride. An interesting section of the pamphlet treats of the use of calcium in skin diseases, and allusion is made to the good results obtained by Trenk in a clinic at Munich which followed the use of Calcibronat in eczema, urticaria, pruritus, and varicose ulcers, the effect being particularly striking in urticaria. Calcibronat is a new organic salt, Ca-Br-Lactobionate $(C_{12}H_{21}O_{12})_2.Ca.CaBr_2+6H_2O$, and is designed to combine the sedative properties of a bromine-ion with Calcium-Sandoz.

A VERY GENERAL QUERY

A SUBSCRIBER writes to us in the following terms: "I shall be glad to hear from any subscribers who have had any reason whatever for being dissatisfied with any dealings involving time payments, or deferred terms, or subscription payment systems in connexion with a publication." The writer of the letter has discussed the situation with us and hopes to get into touch with others who have received unsatisfactory treatment from a particular firm. Replies can be addressed to G.P., THE LANCET Office, 7, Adam-street, Adelphi, W.C.2.

MICROSCOPES AND ACCESSORIES.—A catalogue has reached us from Messrs. W. Watson and Sons, Ltd., London, describing instruments, optical components, and accessories manufactured by them. It is encouraging to note in this thirty-fifth edition that more attention is now being paid, by one of the oldest makers of microscopes in England, to the consistent production of high-grade apparatus. This has not always been the position; English makers could often produce good microscopes, but they did not do so always and with certainty. Modern machine-tool methods are no doubt largely responsible for the improvement, but unless these are accompanied by stringent tests the results might still be irregular. Messrs. Watson have evidently realised the importance of this with the result that their standard is now both higher and more uniform. Practically every application of the microscope in industry or scientific research has been considered, and the information contained in the catalogue will be of service particularly to the novice.

Births, Marriages, and Deaths

BIRTHS

ATKINSON.—On May 6th, at Melton Mowbray, the wife of M. W. Atkinson, M.R.C.S. Eng., of a daughter.

COOPER.—On May 6th, at Stafford, the wife of Thomas Valentine Cooper, M.B. Lond., of a daughter.

GREGOR.—On May 8th, at Coventry, the wife of W. Gregor, M.B. Aberd., of a son.

JAMES.—On April 30th, at Stoke Bishop, Bristol, the wife of J. Angell James, M.D. Lond., F.R.C.S. Eng., of a daughter.

MATTHEWS.—On May 7th, at Cowfold, Sussex, the wife of T. E. Matthews, M.R.C.S. Eng., of a daughter.

QUINN.—On May 2nd, in London, the wife of Surg. Lt.-Comdr. F. B. Quinn, M.B. N.U.I., Royal Navy, of a daughter.

SERGEANT.—On May 8th, at Shanghai, the wife of Major F. C. Hilton Sergeant, M.B. Liverp., R.A.M.C., of a daughter.

STEPHENS.—On April 30th, the wife of Deri Stephens, M.R.C.S. Eng., of Ferguson-avenue, Gidea Park, Essex, of a daughter

MARRIAGES

BAMFORD—LEEMING.—On April 25th, at St. James's, Cheltenham, J. Brian Bamford, of Ely, formerly of Ightham, Kent, to Eileen Mary, daughter of Dr. Arnold Leeming, of Cheltenham.

FYSH—CUMMINS.—On May 8th, at Maidenhead, Christopher Mark Fysh, M.R.C.S. Eng., to Eileen Alice, only child of the late Samuel Cummins and Mrs. Cummins, of Cork, Ireland.

MORRIS—MACDONNELL.—On April 27th, Lawrence H. Morris, M.R.C.S. Eng., to Mai MacDonnell.

PIPER—HALL.—On May 11th, at the Parish Church, Pinner, Middlesex, John Wesley Piper, M.R.C.S. Eng., to Phyllis Mary Hall, only daughter of Mr. R. T. Hall, of Pinner.

READING—SEERY.—On April 27th, at the Church of Our Lady of Victories, Kensington, Philip Reading, M.S. Lond., F.R.C.S. Eng., to Kathleen, eldest daughter of the late Patrick Seery and of Mrs. Seery, of Mullingar, Ireland.

SEMON—PILCHER.—On May 2nd, at All Souls' Church, Langham place, Henry C. Semon, M.D. Oxon., M.R.C.P. Lond., to Marjorie, eldest daughter of Captain C. F. Pilcher, of Mansfield-street, W.

DEATHS

CONSIDINE.—On May 4th, suddenly, at Kill o' the Grange, Co. Dublin, Thomas Ivoy Considine, F.R.C.S.I., aged 67.

JENNINGS.—On April 30th, at Southsea, Colonel Richard Jennings, C.B.E., M.D., late A.M.S.

JEREMY.—On May 1st, at Colehill, Wimborne, Mary Ethel Jeremy, O.B.E., M.B. R.U.I., L.S.A., sometime staff officer at the Memorial Hospital, Ludhiana.

MUSSEN.—On May 8th, at Chichester, William Mussen, L.R.C.P. Edin., late of St. Helens, Isle of Wight, aged 70.

QUINTON.—On April 29th, at Winchester, Richard Frith Quinton, Surgeon-Captain, R.N. (retd.), second son of the late Dr. R. F. Quinton and of Mrs. Quinton, Twyford, Winchester, aged 46 years.

SCHILLING.—On May 8th, very suddenly, at Kessingland, near Lowestoft, George Schilling, L.M.S.S.A. Lond., in his 69th year.

WESLEY.—On May 6th, at Nottingham, Frank William Wesley, O.B.E. (Mil.), M.D. Lond., late Act. Major, R.A.M.C., B.E.F., aged 65.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.